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MINE ACCIDENTS AT BROKEN HILL AND THEIR TREATMENT AT THE BROKEN HILL AND DISTRICT HOSPITAL.

By **Melville Birks, M.B., B.S. (Adel.), F.R.C.S. (Eng.),**
Medical Superintendent, Broken Hill and District Hospital.

Introduction.

In the first place, let me say that I do not wish it to be thought that I am dealing with mine casualties as though they differed in any essential from the casualties that are being treated by every general practitioner. I have been ambitious enough to deal with a subject that is familiar to all present.

Ten years of rustication may have left me a "back number"; if so, I may fail to bring forward any new ideas, or to call your attention to any matter worthy of your notice.

One reason that has led me to choose a subject familiar to all present is the success which has attended the discussion by this Branch of the British Medical Association of such familiar subjects as infant feeding.

Mine Accidents in Broken Hill.

During last year (1917) 460 mine accidents were treated at the Broken Hill and District Hospital. This would be about half the total number of casualties of the mines. The great majority are very slight. Many of the patients have their wounds dressed at the mine ambulance room, and only see their lodge doctor when certificates are required. Of the 460 treated at the hospital, 350 were treated as out-patients, and 110 were admitted to the wards. Of this number, only 32 required a general anæsthetic, and there were three deaths.

It is interesting to note that, though one of the main functions of the Broken Hill and District Hospital is to deal with mine casualties, of the 570 anæsthetics given in the institution last year, only 32 were for mining casualties, and out of 1,251 admissions, only 110 were for mine accidents.

For the 10 years preceding the outbreak of war, the Broken Hill mines employed between 6,794 and 8,763 men. The deaths from accidents varied from 14 to 29 per annum. The average death-rate from accidents of the mines during that period was 0.23% per annum of the men employed.

Causes of Accidents.

The order of their frequency is as follows:—

(*i.*) Slight injuries to hands and feet in the handling of ore. These consist chiefly of crushed fingers and bruised feet.

(*ii.*) Falls of ore. This is the most common cause of severe and fatal accidents. Rock falling from the roof of a slope may lacerate any part of the body, and may break any bone of the body. Generally these are several injuries. The spine and the thighs are often fractured as the body is doubled up under the falling mass.

(*iii.*) It is surprising to find how far a man can fall without fatal result. One man fell 27.5 metres; he fractured his thigh and dislocated his shoulder, but was back at work within two years. Falls of 6 to 12 metres are not uncommon without fatal results.

(*iv.*) Explosions. These accidents are usually due to the fact that the men frequently fail to observe the regulations that govern blasting operations. The most common lesions from these accidents are lacerations of the face, frequently involving the eyes. Pieces of ore may be driven into any part of the body, but the man is usually facing the explosion, so that he gets them in front, and the fragments do not often penetrate deeply. It often happens that the injured man has many small fragments of ore in the subcutaneous tissues of his thighs, abdomen, chest and scalp.

(*v.*) Accidents caused by machinery.

(*a*) Belt accidents, which are either caused by a man's clothing being caught in a belt, and the man is then hurled with great force into the air, or against some part of the machine, (these are usually fatal, or at least very severe accidents), or a fast running belt may come in contact with a portion of the man's arm, when it cuts and burns out a wide track of skin and underlying tissues. Belts will thus cut out a clean, wide groove into bones.

(*b*) Cog wheels may catch fiingers, or as happened here in a case three years ago, the arm just above the elbow passed between two cog wheels standing 1.2 cm. apart. In that particular case no important nerve or blood vessel was injured, and after plating the humerus, stitching up muscles, etc., the man had full use of his hand and forearm, though his elbow had only regained some 10° of movement.

(*c*) Circular saw accidents usually involve fingers or a greater proportion of the hand.

(*vi.*) Asphyxia through being buried in earth or finely crushed ore. These accidents are usually fatal.

(*vii.*) Burns and scalds.

(*viii.*) Cage accidents. Of these, there have been only two which have caused injury to men during the last five years. Both occurred through a cage being allowed to strike the bottom of the shaft. In one there were three men, two of whom suffered from fractures about the knees or ankles. The third man was severely shaken, but was not admitted to the hospital.

In the other case only one man was in the cage; he realized what was about to happen, and so clung to the roof of the cage, lifted his feet off the floor and escaped with many bruises and some strain of the muscles of the back.

Treatment.

We are learning much from articles dealing with the treatment of war wounds.

[1] Read at a Meeting of the South Australian Branch of the British Medical Association on April 25, 1918.

The main differences in the character of wounds of war and those of the mines is due to the high velocity of the missiles causing wounds in war. Pieces of metal travelling at very great velocity destroy masses of tissue around the area actually touched by the foreign body. Another result of the high speed is the deep imbedding of foreign bodies, which we seldom see, even in cases from mine explosions.

In treatment, there are two conditions which influence methods adopted:—

(1) In war conditions the time that elapses between the inflicting of the wounds and efficient treatment may depend more on the exigencies of war than on principles of good treatment.

(2) Under war conditions, wounds are contaminated with a much greater variety of virulent organisms than are found amongst mine wounds. For instance, we have not yet had tetanus occur after a mine wound. We, therefore, do not consider antitetanic serum as necessary in routine treatment.

Flesh Wounds.—The great majority of our cases come under this heading. Fingers or toes cut or crushed, cuts about the head or limbs inflicted by pieces of falling rock.

In treating open wounds we practice the following routine:—

(1) The patient is attended to as soon after the accident as possible. Two or three hours' delay may make the difference between a wound that is dressed once or twice and one which becomes septic and requires frequent attention and much time and dressings, with much pain and danger to the patient.

A good light for work at night, especially over the operating-table, is necessary. We use three 600 candle-power lights, with inverted holophane shades, to distribute the light, and a 100 candle-power hand lamp. Wounds should be treated while the capillaries are still oozing, and so the wound, after being cleaned of gross dirt and dead tissue, is bathed with living blood.

(2) All unnecessary handling or exposure of the wound is avoided. A sterile first-aid dressing is applied by the ambulance officer of the mine. My instruction to these officers is to wipe away any foreign matter from the wound with sterile wool, to paint round the wound with iodine solution, and then to cover it with a sterile pad. The best method for them to clean their own hands is to wash in soap and water, and then to saturate their fingers with iodine solution.

This dressing should not be removed until the surgeon is ready. It may be necessary to look at the wound to decide whether general anæsthesia is necessary, and whether it is necessary for the surgeon to wear rubber gloves. If the wound has to be touched with the hands at all, rubber gloves are worn.

(3) The skin around the wound is then shaved and cleaned with soap or pure lysol. (Any good solution of cresylic acid in soft soap will do. We have been using saporal.) This is cleaned off with *spirit. vin. meth.*, and the skin is then scrubbed with iodine solution (2½% of iodine in *spirit vin. meth.*).

(4) The wound is then cleaned out and all tissue so injured that it is not likely to recover vitality, is cut away. It is very important to leave no fragment of dead tissue as a nidus for organisms.

(5) In cleaning out a wound we avoid as far as possible washing with aqueous solutions, and especially with any solution with a saline content, which is hypotonic to blood and tissues.

The wound is swabbed out with pure lysol, turpentine or ether. In large wounds and compound fractures we use turpentine, and remove the excess with ether.

If actual washing is necessary, we use one in twenty lysol solution, eusol, or hypertonic saline solution.

If I may venture, before those whose theoretical knowledge is vastly greater than my own, to put forward an hypothesis, I would make the following suggestions: Turpentine, ether and lysol may or may not kill organisms, but they do set up some reaction in the tissues which enables those tissues to destroy organisms. It may be that soft soap would do as well as lysol. I have not been brave enough to dispense with the cresylic acid, but I have suspicion that its action is not important. Aqueous solutions, and especially hypotonic solutions, have an opposite effect on the living tissue cells. We have given up using solutions of mercury salts or iodine as applications for freshly exposed tissue cells.

(6) The wound is then closed with as close apposition as can be obtained without undue tension on the stitches. Tension cuts in skin are sometimes useful, and these are packed with medicated gauze.

Unless there is some definite cavity that cannot be closed, no drainage is provided.

In cases where cavities or spaces are inevitable, we pack them with medicated gauze, which is not removed for three or four days, or sometimes longer. The wound is thoroughly painted over with iodine after the stitches are inserted.

(7) The wound is covered with a light dressing. If the patient is to leave the hospital, a pad of cotton wool is applied; if he remains in, a few layers of gauze may be sufficient.

If there is a good skin apposition, and the patient is to remain in bed, a good painting with iodine solution, followed by the daily application of *spirit. vin. meth.* will make dressings unnecessary. We sometimes apply this method to compound fractures, when dressings would interfere with frequent inspection of the limb.

After Treatment.

If there should be oozing through the dressings, the nurse is instructed to take a piece of gauze wet with iodine solution to cover the wet spot, and to apply a sterile dressing of cotton wool on top, without removing any dressing. The wound is not uncovered again for seven to ten days. If there is packing to be removed, or when the stitches are to be removed before the wound has healed, rubber gloves should be worn by the person doing the dressing, and a sterile towel should surround the field.

The smallest wounds are treated on the same lines. The skin is cleaned with turpentine or lysol, and then with iodine solution. The wound is swabbed out with pure lysol, which is immediately cleaned off with a swab wrung out of dilute lysol solution. Gloves

are not worn if all handling of the wound can be done with forceps. No wound is too small to become infected.

We used to be taught that soiled wounds required less aseptic care than clean ones, because the wound was already infected.

We now reverse this teaching, and say that all wounds are infected, but if there are not too many organisms present, or too many different kinds, the blood and tissues will deal with them. Therefore, if a wound is infected, the greatest care must be exercised so that no more organisms, and no additional varieties or strains of organisms are introduced.

The tourniquet is never, or very rarely, used. In big amputations we used to have one ready, but it is now usually forgotten.

In nerve sutures, operations on joints and small amputations, we look upon it as harmful, as it may lower the resistance of the tissues.

Suppuration.

If a wound should become infected, as may occur in wounds not treated soon enough after the accident, we take off the dry dressing and apply one which will induce a dilatation of capillaries in the infected area. For the purpose we use one of the mixtures of sterile anhydrous clay and glycerine. This is applied hot and changed every 12 to 48 hours, according to the time it relieves the local pain. Besides causing dilatation of capillaries, this dressing absorbs a quantity of moisture, and thus causes a flow of fresh serum to escape from the wound.

As we do not disturb dressing to examine wounds, pain and tenderness are our guides to the onset of inflamation, and the body temperature is carefully watched.

If the inflamation goes on to suppuration, the stitches are removed and the clay dressing reapplied. If there is more discharge than the clay and glycerine will absorb, we change the dressing and apply eusol, keeping the wound thoroughly saturated to the bottom with this solution.

Nurses attending to such wounds wear gloves and gowns, and the patients are isolated.

The instruments, bowls, thermometers, etc., used for these cases are not used by nurses who have to nurse other surgical cases. This is done not only to protect other patients, but also because we believe that reinfection of a suppurating wound, is more dangerous than the infection of a clean one.

As soon as a suppurating wound remains stationary for a few days, it is time to consider the advisability of having an autogenous vaccine prepared.

We prepare our own vaccines, and use mixed vaccines for mixed infections.

We believe that the routine use of vaccines, whereever the tissues appear to be failing to react sufficiently to eliminate the infecting organism, is saving an immense amount of work, and our patients much time of invalidity.

Fractures.

Compound fractures are treated in the same way as open wounds.

The ends of the bones are well scrubbed with turpentine, which is dried off, and then washed over with ether. The wound is sewn up without drainage, if good apposition is possible.

Fractures Without Wounds.

Our methods of treatment of fractures have been in the melting pot, and with the help of the writings of Robert Jones of Liverpool, and Hamilton Russell of Melbourne, and some articles from the war zone, we are drawing up our new precedure.

A few principles which we feel that our experience confirms might be briefly stated, as follows:—

The patient should be placed under treatment as soon after the accident as possible; a few hours delay is not as serious as it is in dealing with open wounds. The bones should be placed and maintained in good position with the least possible amount of pressure.

A general anæsthetic should be used, if necessary; it is better to err on the side of anæsthetizing too often than not often enough.

If good position is not easily maintained with extension and light pressure the surgeon should cut down, and get good apposition by open operation.

Chromic gut, silver wire, a screw, or plates may be necessary, but the essentail point is to remove the cause of the faulty apposition.

For splints we are using light rod iron more and more, as our experience of such splints increases.

A Thomas's knee splint, with extension or without extension, is used for nearly all fractures of the thigh or leg. We carefully avoid tight bandages or pressure on splints, which may interfere with the circulation of the blood or the nutrition of the part.

Any splints or bandages, which interfere with daily examination of the fracture, are avoided if possible.

If the alignment of the limb is not altered, slight movements of the fractured ends probably do more good than harm. Active movements of muscles about the fracture is a great help in rapid and firm union. Carefully watched active movements will do good, while attempts at pressure movements would do harm.

The more massage and active movements that can be applied the better, provided there is no more alteration in the relations of the fractured ends of the bone than occurs between the ends of the fractured rib during quiet respiration.

Burns.

The paraffin treatment has given good results. We have been using No. 7 formula.

We apply the melted wax with a broad fine haired varnish brush. We have not yet tried the spray.

Injuries to Abdomen.

We read in our text books that when in doubt about an abdominal injury, it is better to open the abdomen and examine it. We have good reason to endorse this teaching, though in some cases it is hard to convince oneself of the necessity until it is too late.

The pulse is absolutely unreliable as an indication of the gravity of internal injuries, and if one waits for a failing pulse, it is our experience that generally the right time to operate has passed.

After abdominal injury, when one has made a careful examination, morphine may be given to combat shock. If so, and if it is noticed that the morphine fails to give the relief one would expect, this failure

to react to morphine may be taken as a very grave sign, and is a sign strongly in favour of serious injury to an internal organ.

Shock.

In the treatment of shock the last few years have seen much change of practice.

We still lay great stress on keeping the patient warm, and avoiding, as much as possible, mental and physical discomfort.

A patient's confidence in the Hospital is a factor that one might easily overlook, but I am sure it is not small factor in the treatment of shock, as well as of many acute diseases. It pays well to keep and deserve the confidence of the public.

We have practically given up using stimulants. Alcohol and strychnine are now looked upon as dangerous. In fact these drugs are hardly known in our surgical wards now-a-days.

Morphine is our sheet anchor. We use it to prevent and to treat shock. In severe accidents we usually give 0.03 grm. hypodermically. If the shock is not successfully combated by the foregoing, our next step is to give intravenously half a litre of hypertonic saline solution.

For this purpose we use the following formula:—

Sodium chloride, 2.00 grms.
Potassium chloride, 0.05 grm.
Calcium chloride, 0.05 grm.
Saturated solution of gum arabic, 6.00 grms.
Distilled water, to 100 c.cm.

In recent literature it is recommended that sodium bicarbonate should be substituted for sodium chloride, but we have not used it yet.

Where large nerves have to be cut or manipulated, as in amputations of limbs, and in the cleaning up of wounds in which large nerves are exposed, the nerve is injected with a local anæsthetic at a point above the seat of amputation or injury. This can sometimes be done subcutaneously where the nerve is easily located, or a separate cut may be necessary.

In some amputations the cut for the skin flaps can be made so that the first part of the incision exposes the nerves and vessels. The nerves are then exposed for 6 to 8 cm. above the level of the amputation injected with local anæsthetic and divided. For this injection, first, epicaine, about 0.5 c.cm. is injected into the nerve trunk. This is then followed by an injection of 3 or 4 c.cm. of urea and quinine hydrochloride solution.

The first injection gives a rapid but short anæsthesia, the second is intended to act as the effect of the first wears off.

Before adopting the intravenous hypertonic saline, isotonic solution was used and frequently horse serum hypodermically to help to arrest hæmorrhage.

It was noticeable that when the serum was used, shock was much less marked. We think it probable that enough serum was absorbed to increase the viscosity of the blood, and thus act as the gum arabic is intended to do.

Anæsthesia.

Owing to the shortage of medical men, it has been necessary to employ nurses as anæsthetists. On this account it has been doubly necessary to use the safest of anæsthetics. Open ether, reinforced with hot towels, is our routine, and no variation is practised by our nurses.

With our more experienced anæsthetists, it is not uncommon for a hundred consecutive anæsthetics to be administered without the surgeon's attention being once directed either to the anæsthetic or the anæsthetist. Before the war we were using German ether, but I am pleased to be able to report that the war has forced us to use a better and a cheaper article. We now use the Woolwich Chemical Co's. Australian-made ether. I trust that before the war is over we will be able to make a similar report of many other Australian-made drugs.

Deaths Under Anæsthetic.

If a patient has been taken to the theatre and it is there found that his condition is very grave, we do not hurry him back to the ward. In the theatre, with an electric heater, we are able to keep him warm, we can give much better attention than if he were in his bed in the ward. It also saves the depressing effect of a death in the ward, if the patient, when death is inevitable, dies in the theatre. We are, furthermore, in a better position to face the coroner and say that all was done that could be done, than we could if we had hurried the patient back to the ward. This same rule is applied to all desperate cases in the theatre as well as to accidents.

Where inquests are held to protect the safety of the public a death in an operating theatre must reflect to the credit of the surgeon who stands by his case and works till all hope is past.

GUNSHOT WOUNDS OF THE KNEE-JOINT.

By **Balcombe Quick, F.R.C.S.,**

Lieutenant-Colonel, Australian Army Medical Corps; Surgical Specialist, First Australian General Hospital, France.

(*Continued from page 492.*)

With Bone Injury.

Some damage, varying from a slight infraction or grooving to the most severe comminution of the bones forming the joint surfaces, is present in more than half the cases seen, greatly increasing the gravity of the injury. For to an arthritis, if it occurs, is then added an osteitis, with all its dangers of septic thrombosis and septicæmia.

(*a*) *Patella.* Unless the margin of the bone be the part struck, when some small fragments alone are chipped off, the patella is generally considerably comminuted.

When the injury is marginal the small fragments detached should be cut away and the adjacent fractured surface removed with bone forceps or *rongeur*, until a perfectly clean face is assured. The further treatment then followed is as indicated in cases without bone injury, *i.e.*, in the early case without apparent sepsis, the edges of vastus expansion and synovial membrane, as left after excision of the wound, are sutured to the fibro-periosteal covering of the patella, and the joint thus closed after thorough washing out. In later and more doubtful cases Carrel's tubes are passed into the

joint, the wound being left open until the condition is assured, when it may be closed secondarily.

Where the patella is comminuted it should be completely excised as being the only certain method of removing all soiled parts. The expansion covering it is preserved as far as possible, the knife being kept close to the bone.

The excision may be performed by a long vertical incision enclosing the wound, or by a horse-shoe incision, dividing the *ligamentum patellae* and turning up a flap. The former method is the better, if it is intended to close the wound completely, the latter if Carrel's tubes are to be introduced, and they will then be passed in from the sides of the horse-shoe, the *ligamentum patellae* and skin at its lower part being sutured back in place.

The edges of the tendinous expansion from which the patella has been removed, should be approximated as far as possible by catgut sutures before the skin wound is sewn up.

A method that we have used when it was difficult, from the extent of the damage, to close the joint in any other way, is to dissect up the synovial membrane in a flap from the back of the supra-patellar pouch, turn the flap down and suture it to the edge of the infra-patellar pad of fat.

With regard to fracture of the patella caused by shrapnel bullet, consideration of which was deferred from an earlier section, I have seen but one case, in which operation (an imperfect excision of the superficial tissues which were widely lacerated) had been performed at a casualty clearing station. The wound, in spite of this incomplete removal of the damaged parts, had been sewn up over a salt pack, and arrived in an infected condition. The patella was found broken into two main fragments, upper and lower, with some smaller ones, and was removed. The same case was interesting in that the outer posterior pouch alone became infected—the main injury was on the antero-external aspect of the joint—and it was treated by division of the external lateral ligament and posterior drainage on that side. I have not included this case in the series of 11 cases previously mentioned.

When comminution is present, even though due to shrapnel bullet, I think that excision of the patella will be the safest and best procedure, having regard not only to the difficulty of satisfactorily cleaning the bone surfaces but for the disability that may ultimately occur from an irregular articular surface.

As excision of the patella was a very rare operation before the war, the following report, received from a patient of Major C. S. Browne, four months after operation, is of great interest. "I have no trouble at all in walking, and can walk without the slightest limp. The leg is quite strong, although a bit smaller than my right leg. I had vigorous massage for about six weeks, in which time I could bend my knee as much as ever I could."

(*b*) *Tibia and Femur.* Injuries to these bones may be considered together, as the same principles apply to both, and as the actual lesions are so varied it is impossible to do more than state the broad underlying principles of treatment.

Whether the lesion be a mere infraction or a penetrating bone wound there is some opening up of the cancellous tissue, and hæmorrhage into the surrounding cancellous spaces. This bruised bone, which may sometimes be found to a depth of 2.5 cm. or more from the site of the missile, is not only extremely prone to infection, but when this has occurred will constantly reinfect the joint, acting, in fact, just as a retained foreign body. The depth of bruising varies with the size of the fragment and its velocity, but in every case the aim of the operation is removal of any foreign body present, followed by removal of the bruised bone around by gouge, chisel or saw. The extent of bone to be cut away will vary with the judgement formed of the likelihood of infection and its duration. In a recent case of severe fracture of the head of the tibia and fibula, opening the joint, for which amputation was performed, I removed, with every precaution, a specimen of cancellous bone from a depth of rather more than 2 cm. below the surface of the bone wound. This contained streptococci and staphylococci, yet the wound was only three days old.

In the same way, when a fissure exists in the bone, as is very commonly the case, the outlook, if the wound becomes infected, is a serious one, for the infection will rapidly spread along the fissure to the medullary cavity.

The foreign body, in my opinion, should be removed in every case, unless it is very small, the size of a grain of wheat or less, and deep in the centre of the bone. These small fragments are often sterile. All others, after careful localization, should be followed along the track of entry, which is enlarged with gouge and curette, and removed. The more complete the removal of bruised cancellous tissue around the track and foreign body can be made, the less liability will there be of subsequent bone infection, and where it can be checked by the eye it should be continued until the gouge or curette reveals normal firm, bleeding bone structure.

The foreign body and bruised bone removed, the treatment of the joint in those cases in which infection is found not to be present, or to be of very mild type only, will follow much the same lines as already laid down for wounds without bone injury.

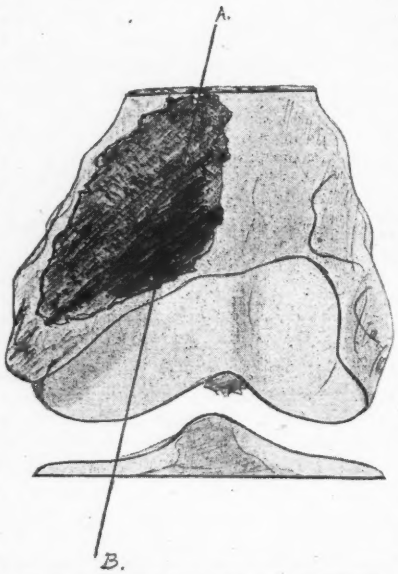
When the infection is more severe, much will depend upon the nature of the cancellous wound. One which is frankly external, a groove or gutter with clean smooth surface after chisel or gouge has cut away the damaged bone, has far less serious possibilities than has a tunnel deep into a bone end.

It is absolutely necessary that such a surface or recess shall, under no circumstances, be allowed to remain in contact with pus. A repeated cleansing must be ensured each time the Dakin solution sweeps over it from the Carrel's tubes placed in contact with it. To bring this about a much freer opening of the joint is necessary than in cases without bone injury, and this will be secured by operation, as in the fifth method or seventh method. Free opening by this latter may also be necessitated by the joint infection itself, apart from the condition of the bone. When this retains a normal colour and becomes gradually covered with a layer of granulations, the risk of osteitis is very

small, and the case has practically assumed the status of a pure arthritis.

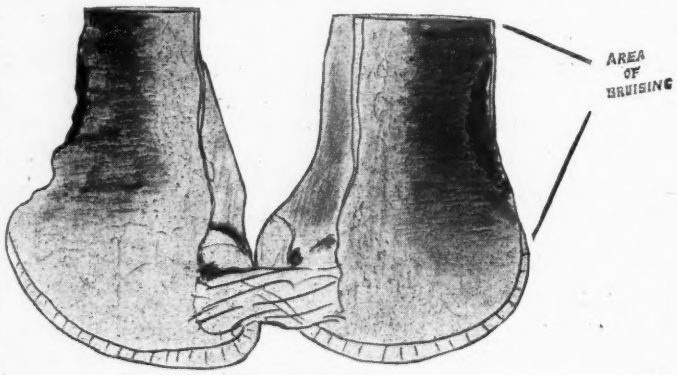
When, in the presence of a severe infection, it is not found possible to secure satisfactory cleansing of the bone surface, and it remains in contact with pus, without sign of healthy reaction, a state of grave danger exists. Unless this be recognized and a timely excision be done, the patient will die within a few weeks of septicæmia or make a slow and precarious recovery after amputation.

Where the extent of the bone injury, immediately or after the necessary removal of fragments and damaged cancellous tissue, makes it apparent that the statics of the joint are gravely compromised, an excision of the knee must be carried out. The result of this is not only to regularize the opposed surfaces so that, after ankylosis, a straight bony column, capable of weight bearing, will remain, but, by providing clean-cut surfaces and free drainage in the almost certainly infected joint, to minimize the risk of osteo-myelitis and give the patient the best chance of retaining his limb.



Specimen Removed from XIII. (see Radiogram).

With these cases must be classed those in which, with a bone wound of moderate extent, a crack runs up between the condyles of the femur or down into the shaft of the tibia. Though such a condition is no doubt amenable to conservative meaures when early operation at a casualty clearing station is carried out, after 48 or 72 hours have elapsed and infection is established, nothing short of excision is likely to succeed. It is not uncommon for patients to arrive here at this stage with the cancellous tissue already foul smelling and for the skiagram to show the presence of a split running from the site of the foreign body to the articular surface, the joint being involved either primarily or secondarily.



Section through A-B.

In these three types of wound, then, a decision has to be made between excision and amputation, the deciding factors being: first, the distance to which the fissuring or comminution extends; and second, the severity of the infection and the presence and extent of wounds elsewhere. When more than 6.5 to 8 cm. of the femur would need removal for the saw to pass through unbruised bone, as is necessary, with a 6 mm. slice from the tibia, it is probable that amputation is the soundest treatment.

When the injury is distributed between the tibia and the femur, a total shortening of a little more than 6.5 cm. is still compatible with union and a useful leg.

At the operation, the transverse limb of the incision is carried well back on each side and the patella and redundent skin, etc., removed. The synovial membrane is dissected off the ligament of Winslow, for otherwise, when the bone ends are approximated later, the swollen membrane pouts up between them.

In the early part of the treatment slight extension separates the sawn surfaces and ensures free drainage, several Carrel's tubes being placed between and around the bones. Unless the temperature shows a definite downward trend within the next few days it is unwise to delay amputation, as infection, spreading behind the bone ends, or an osteomyelitis, is probably the cause.

Too much stress cannot be laid on the danger of a wound involving the cancellous tissue of the femur or tibia which is allowed to remain bathed in pus. Such a case may appear to progress fairly well for a time, until some such sign as the development of a pleuritic rub makes it quite evident that a general infection has occurred. An amputation at this stage is accompanied by grave shock, and even with this weathered the mortality will remain high. The liability to septicæmia appears to be very much greater with wounds of the head of the tibia than of the lower end of the femur.

Skiagrams XI., XII. and XIII. illustrate injuries of this type. No. XI. was treated by method 7, the others by excision. A sketch of the specimen removed shows the extent of bruising of the cancellous tissue in No. XIII. The shadow to the inner side of the plate in No. XII. is due to bismuth-iodoform-paraffin paste inserted at the casualty clearing station. It can be seen how impossible it is by this method of treatment to bring the antiseptic into contact with the large infected foreign body and the fragments of bone.

Where the condition of the joint necessitates such measures as wide transverse arthrotomy or excision,

it has been said that conservative treatment is likely to be less satisfactory in the end than immediate amputation. I submit that this is not so, for the following reasons. A certain number of excisions, especially if done early, as at a casualty clearing station, will suppurate little or not at all, giving a firm and satisfactory union. These must be reckoned to the good. When non-union follows and the extent of bony removal forbids a re-excision, a clean amputation can be done. In the same way, if after transverse arthrotomy non-union occurs, a clean excision is always possible. To my mind a stiff leg, unless the seat of pain, is preferable to any artificial limb fitted to the thigh.

The results obtained in the 16 cases treated by transverse arthrotomy are as follows, in their order:—

1. Amputation after a month. Recovery.
2. Amputation after 4 days. Recovery.
3. Amputation after 16 days. Recovery.
4. Recovery. Walks well with stiff leg.
5. Recovery. Firm union of doubtful nature.
6. Recovery. Nature of union unknown.
7. Recovery. Nature of union unknown.
8. Recovery. Nature of union unknown.
9. Amputation 6 six days later. Recovery.
10. Recovery. Firm union of doubtful nature.
11. Recovery. Walking.
12. Recovery. Firm union on discharge.
13. Recovery. Slight union on discharge.
14. Amputation. Death 6 days later from septicæmia.
15. Recovery. Still in hospital. Not united.
16. Recovery. Still in hospital. Not united.

In the earlier cases the importance of bone injury was under-estimated, and excision should have been the operation performed in Cases II. and III.

I am under a debt of gratitude to Major C. S. Browne for the use of his extremely helpful clinical notes in the preparation of this article.

Reports of Cases.

A CASE OF LACTOSURIA WITH ACETONE AND DIACETIC ACID.

By **H. C. Carden, F.R.C.S.I.,**
Bute, South Australia.

A few weeks ago I was called to see a Mrs. B., *aet.* 29 years, who told me that for the previous month she had been to her parental home for treatment of her complaint, namely "vomiting." She had returned to her own home, after three weeks, with slight (if any) improvement of her symptoms, which were put down to gastritis. It was at this stage of events that I was called in. She then presented the following history:—

Vomiting had been present for the last four weeks, and was becoming more frequent, accompanied by little, if any, retching. She was suckling a baby six months old. She had three other children, all well. She had no definite pain; the temperature was slightly raised, and the pulse-rate was slightly higher than the average. The face was flushed, and she did not show any undue effects from her previous month's suffering.

On my questioning her, she informed me that the "vomiting attacks" were increasing, and that, at that time, she was practically unable to keep any food on the stomach at all. She complained that at times she suffered from exceeding weakness, which was accompanied by palpitation and giddiness. These "turns," as she described them, were becoming much more frequent. She had experienced three or four the day I called. She felt she had all she could do to prevent herself from lapsing into unconsciousness, and with this experienced a great fear of impending death.

On examination, nothing untoward was found physically. The heart and lungs were sound. The smell of the breath, and in the room generally, gave me my only clue. An examination of the urine yielded the following result: Colour, pale straw; specific gravity, 1,025; no albumin; reaction, acid. Sugar was present, but only slowly becoming apparent after boiling with Fehling's solution, which, for true sugar, should not be necessary. Acetone was evidently present, if the deepness of colour be any criterion by the sodium nitroprusside test, in large quantities. Diacetic acid was also present.

I had not long made the above examination when the patient was brought into hospital, having experienced some more of the previously-described very bad "turns," greatly alarming the relatives.

She could not now even keep a drink of water down. I immediately ordered large injections *per rectum* of solution of sodium bicarbonate and glucose syrup, to be very slowly given. A few hours afterwards she was able to take, and keep down, drinks of solution of sodium bicarbonate, which I alternated with drinks of glucose syrup and water sweetened to taste. She had no more vomiting and no more "turns." The breasts had to be relieved of their milk.

On relaxing the above treatment, acetone again made its appearance. It then struck me that it was the milk that was at fault, and that it was a case of lactosuria, with the dangerous complication (as in diabetes) of acetone and diacetic acid. Though I went into no further analysis, the fact of the slow change, and the necessity of boiling the Fehling's solution and urine seem to confirm the diagnosis.

The reducing power of lactose is to that of glucose as seven is to ten.

I immediately relieved the breasts of their milk supply and applied the usual belladonna plaster, when all the above symptoms subsided, and did not return on relaxation of the sodium bicarbonate and glucose treatment.

In conclusion, I think the case of rather uncommon interest, and one which may at any time fall across the path of the general practitioner.

Reviews.

THE PSYCHICAL FUNCTION OF THE CEREBELLUM.

In the Psychical Function of the Cerebellum[1] Dr. Silverman attempts to show that the cerebellum is the seat of the subjective mind, *i.e.*, of the emotions and morality; the cerebrum being, *a priori*, the seat of the objective mind, *i.e.*, of the intellect, reason and understanding. The first and longest chapter is devoted to psychology, and though it contains some platitudes and irrelevant matter, it fulfils its object, which is to emphasize the relation between feeling and the subjective life, and introduce the main argument, one by analogy. Briefly stated, this is that the psychical relations of feeling to thought are as the relations of cerebellar to cerebral action in the execution of muscular movement. Hence the logic given as underlying the analogy is that since the intellect is subserved by the cerebrum, therefore feeling or emotion is subserved by the cerebellum. Dr. Silverman claims that his method depends on inductive logic, and so is truly scientific, but we need hardly point out that for inductive reasoning and progress in science, it is necessary to have first, not mere observation, but correct and exact observation of the facts and their truth established, this before an arranging and correct interpretation of the facts can lead to advance. Now, the facts adduced by Dr. Silverman are weak; thus, in the chapter headed "Confirmatory," we find reliance placed on a number of Hol-

[1] The Psychical Function of the Cerebellum, by Isaac Silverman, M.B., B.S.; 1918. Melbourne: Melville & Mullen, Pty., Ltd. Demy 8vo., pp 96. Price, 5s.

lander's statements, purporting to show that the cerebellum is the seat of sexual love, statements which have little substance; there is also a twisting of Sherrington's experimental deductions to meet the author's purpose, and an appeal to phrenology, and a debatable declaration concerning the function of the semicircular canals. Further, dogmatic statements are made to the effect that the red nucleus is well-known as an emotional centre; that the eye is under cerebellar control (as if there were no other control); that through the rubro-spinal tract the cerebellum controls involuntary associated movements, or movements associated with the emotions. Plainly these are not facts or established truths; on the contrary, they are speculations, and much too unstable to bear the weight of argument placed upon them. We must say, in conclusion, however, that the work gives evidence of earnest thought and wide reading, and though controversial and inconclusive, it is, nevertheless, stimulating.

ANTERIOR POLIOMYELITIS.

Much progress has been made in the understanding of poliomyelitis in recent years and the literature in the shape of books and articles is large. In "Poliomyelitis in All Its Aspects," by Drs. Ruhrah and Mayer,[1] the authors have endeavoured to put in a compact form all the useful knowledge of the disease. The work has been well done. The volume is a handy-sized one and is liberally illustrated. The first chapter contains an informing history of the disease. In the subsequent chapters, the epidemiology, pathology, and classification of the disease, its symptoms and treatment, medical and surgical, are dealt with, and the last chapter contains some useful reminders of the brain, spinal cord and nerves. All the recent investigations of the nature of the disease are summarized. Serum therapy is discussed; this consists of injecting serum from the blood of a convalescent into the spinal canal of the patient. The method of preparing the serum is described. The value of the serum is not definitely established, but it is clear from the evidence that to be of any use, it must be given very early in the disease. Muscle testing and muscle training are exhaustively dealt with and this subject is profusely illustrated. The book is a good one and a useful one, and now that poliomyelitis is frequently coming under the notice of the general practitioner, it should compete for a place in every medical man's library.

ENCYCLOPÆDIA OF MEDICINE.

The fifth volume of the second edition of the Encyclopædia Medica,[2] comprising headings from *filix mas* to "heart," maintains its character well up to the standard of the first volume. As in every other encyclopædia, it gives more than some people want, less than others want, but also a great deal of useful information to those who want just what they find in it. The principal articles in volume V., with the number of pages allotted to each, are as follows: Fingers 10, first aid 23, examination of pathological fluids 12, fœtus 59, gall-bladder and bile-ducts 28, ganglion 3, gangosa 2, gangrene 5, gassing 2, gastro-intestinal disorders of infancy 36, general paralysis 10, female organs of generation 35, glanders 15, glaucoma 15, glycosuria 4, gonorrhœa 6 (females only), gout 17, the groin 6, diseases in gynæcology 22, hæmatemesis 6, hæmaturia 14, hæmoglobinuria 14, and heart 200.

It has been announced that a Clinic for the treatment of male patients suffering from venereal disease has been opened in the offices of the Department of Public Health, Little Lonsdale Street, Melbourne. Dr. C. H. Johnson, who was formerly in charge at the Langwarrin Hospital, is in charge of the Clinic and has two medical assistants. In addition, there are five attendants, a clerk, a dispenser and a porter on the staff.

[1] Poliomyelitis in all its aspects, by John Ruhrah, M.D., and Erwin E. Mayer, M.D.; 1917. Philadelphia and New York: Lea and Febiger. Royal 8vo., pp. 297, illustrated with 118 engravings and 2 plates. Price, $3.25.

[2] Encyclopædia Medica, Second Edition, under the general editorship of J. W. Ballantyne, M.D., C.M., F.R.C.P.E., Volume V., Filis Mas to Heart; 1917. Edinburgh and London: Green & Son, Ltd. Sydney: Butterworth & Company (Australia), Ltd., 8vo., pp. 766, illustrated. Price, £1.

Public Health.

NEW SOUTH WALES.

The following notifications have been received by the Department of Public Health, New South Wales, during the week ending June 8, 1918:—

	Metropolitan Combined District. Cs.	Dths.	Hunter River Combined District. Cs.	Dths.	Rest of State. Cs.	Dths.	Total. Cs.	Dths.
Enteric Fever	3	2	0	0	2	0	5	2
Scarlatina	16	0	0	0	12	0	28	0
Diphtheria	58	2	4	0	85	1	147	3
*Pul. Tuberculosis	14	9	0	0	0	0	14	9
C'bro-Spl. Menin.	1	0	0	0	0	0	1	0
Poliomyelitis	0	0	0	0	1	0	1	0
Malaria	1	0	0	0	0	0	1	0

* Notifiable only in the Metropolitan and Hunter River Districts, and, since October 2, 1916, in the Blue Mountain Shire and Katoomba Municipality.

VICTORIA.

The following notifications have been received by the Department of Public Health, Victoria, during the week ending June 9, 1918:—

	Metropolitan. Cs.	Dths.	Rest of State. Cs.	Dths.	Total Cs.	Dths.
Enteric Fever	1	0	6	0	7	0
Scarlatina	28	0	21	0	49	0
Diphtheria	114	2	58	2	172	4
Pulmonary Tuberculosis	16	9	7	9	23	18
C'bro-Spl. Meningitis	0	—	1	—	1	—
Poliomyelitis	1	—	3	—	4	—

SOUTH AUSTRALIA.

The following notifications have been received by the Central Board of Health, Adelaide, during the week ending June 1, 1918:—

	Adelaide. Cs.	Dths.	Rest of State. Cs.	Dths.	Total. Cs.	Dths.
Enteric Fever	0	0	2	0	2	0
Scarlatina	0	0	7	0	7	0
Diphtheria	7	0	36	3	43	3
Pulmonary Tuberculosis	1	1	7	7	8	8
C'bro-Spl. Meningitis	0	0	2	0	2	0
Puerperal Fever	0	1	0	0	0	1
Erysipelas	0	0	6	0	6	0
Morbilli	0	0	1	0	1	0
Pertussis	0	0	6	0	6	0

QUEENSLAND.

The following notifications have been received by the Department of Public Health, Queensland, during the week ending June 8, 1918:—

Diseases.	No. of Cases.
Enteric Fever	4
Scarlatina	17
Diphtheria	49
Pulmonary Tuberculosis	10
Erysipelas	2
Puerperal Fever	1
Malaria	13

TASMANIA.

The following notifications have been received by the Department of Public Health, Tasmania, during the week ending June 1, 1918:—

Diseases.	Hobart. Cases.	Launceston. Cases.	Country. Cases.	Whole State. Cases.
Enteric Fever	0	0	1	1
Diphtheria	0	8	17	25
Pulmonary Tuberculosis	0	0	1	1
Poliomyelitis	0	0	1	1

The Medical Journal of Australia.

SATURDAY, JUNE 22, 1918.

The Question of Artificial Limbs.

A cabled message has recently been published in the daily press to the effect that Australian soldiers who have lost a limb, are to be sent back without artificial substitutes. Whether this report is reliable or not, cannot be decided now. The present time, however, is propitious for the discussion of the questions involved. The cost of the limbs should not be regarded as the determining factor in the programme, while the future welfare of our lads is concerned. Up to the present the limbless Australian soldier has been cared for on more or less haphazard lines and not a little criticism has been evoked in individual cases, largely because the principles were not sound. The general practice may be summarized somewhat as follows. The man is hit in the field, and received first aid at the field aid posts or advance stations. He is then sent down to the casualty clearing station, where any necessary operative treatment is applied. He is then sent, usually by slow stages, to "Blighty" and passes the first part of his convalescence in some base hospital. When the wound is nearly healed and the danger of acute sepsis is over, he passes to the Australian Auxiliary Hospital at Southall for the purpose of being supplied with an artificial limb and of being taught how to use it. The subsequent care of the man who has lost a limb, depends on whether the missing member is an arm or a leg. The stumps receive the attention of the members of the staff at Southall and at the proper time a limb is fitted. Training in its use is carried out and after a period of varying length the man is transhipped to Australia. On arrival he comes under the care of the military authorities and the medical officers at one of the Australian General Hospitals find that the artificial leg that has been supplied is nearly always useless because the stump has shrunk. The artificial limb has to be cast aside and a new one ordered, or in exceptional circumstances repairs and adjustments will suffice to enable the man to carry on for a time, until the stump has assumed its permanent size and shape. For a long time the artificial limbs were obtained from various sources and no attempt was made to control the making or to guarantee the supply. In the case of artificial arms the majority of the men who have to perform manual work to gain a livelihood, have discovered that the Carne arm which was the standard arm for a considerable period, is thrown away as unsuitable, and the man waits for a more practical and at the same time cheaper article. More recently the Department of Defence has instituted artificial limb factories under the superintendence of a highly paid American expert, who has contracted to manufacture and supply the Aunger limbs for all returned Australian soldiers. The Aunger limbs have a remarkable similarity to the well-known Hangar limbs. Up to the present time the supply of limbs is not keeping pace with the demand. If a large number of limbless men are landed in Australia within a few months, the danger that they may be kept waiting for a limb to get about with for many, many months is very real. It is immaterial for our present purpose to follow the man further until he is discharged from the Army and until the Repatriation Department accepts the responsibility for his proper care.

It is quite natural that the disabled soldier should be anxious to stay as long as possible in England after he has recovered from the immediate effects of his wounding. He is in receipt of much kindness; he has no need to work or to worry much about the future. He has the comfortable conviction that the vast experience of those in England in the treatment of the wounded and of the limb makers will serve as a guarantee that he will receive the best possible treatment and the best artificial limbs. That is the point of view of the man. The Department of Defence, no doubt, takes another view of affairs. The longer the man is kept in England, the greater will be the expense to the Commonwealth and even if the reinforcements are deplorably below the number desired, there is a large bill to be met while men are being kept wholesale in England and the date of their discharge is delayed more or less indefinitely. The third aspect of the matter is the real interests of the disabled men and their dependants.

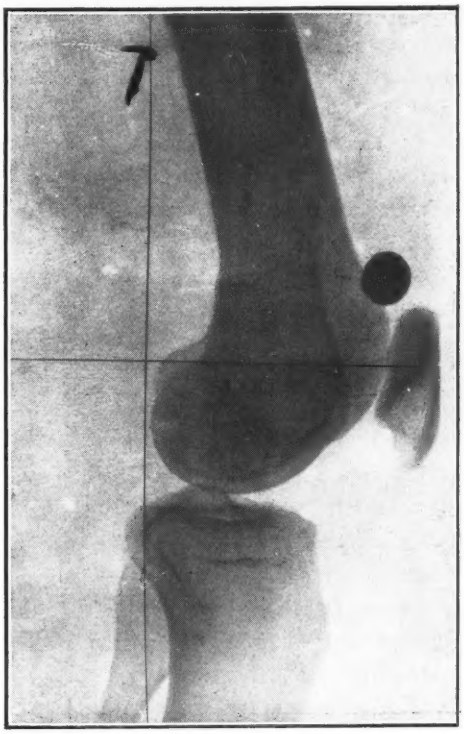
A man who has lost a leg should be placed in a position of earning a livelihood as quickly as possible after his recovery. The stump will shrink considerably during the course of many months after convalescence. It is bad policy to allow him to struggle about during these months on crutches, without an artificial limb; and it is equally wrong to spend more than is absolutely necessary on a temporary limb. Cheap but efficient peg legs or pylons with the bucket made of plaster of Paris or of *papier mâché* have been found to serve the purpose admirably. That the first temporary leg should be supplied in England is indisputable. The loss of time until the man can arrive in Australia is too great to justify delay. Moreover there is a constant tendency for the man to acquire the bad habit of throwing his centre of gravity over to the side of the missing limb, when he gains skill in the use of crutches. After a time the first temporary limb, which can be supplied for 12s. 6d. or a little more, will fail to be serviceable. The second temporary limb might well be provided in England, particularly if in the meanwhile the man is receiving instruction in the proper use of a prothesis. The surgeon should supervise the fitting of the limb and should satisfy himself that no further surgical intervention is needed. Bulbous nerve-endings and other disabilities, which may militate against the usefulness of the permanent limb, must be dealt with. As soon as the second leg is supplied, he should be sent to Australia. That is, he should be sent out provided that the authorities here can guarantee that he will not be kept waiting longer for his permanent limb than the condition of his leg stump demands. When no further shrinkage takes place and the man is properly trained in the use of an artificial leg the type best suited to his needs should be provided. The principle that he should be given one special type of limb from the Commonwealth factories is fundamentally wrong. The medical officer in charge should be authorized to order the limb best adapted to the conditions obtaining, and he should have the right and duty of satisfying himself that the limb is well-made and fits perfectly. It would thus seem that in the interests of the legless soldier the best method would be to retain him in England until the greater amount of shrinkage of the stump has taken place and that adequate arrangements should be made within the Commonwealth to justify him in expecting his permanent limb when the condition of the stump renders this permissible.

The case of the man who has lost an arm is somewhat different. In the first place the stump does not tend to shrink. In the second place the variety of artificial arms that can be fitted, is greater and the training to their use is much more complicated. There is no reason why the man should be kept in England, unless the machinery for the provision of suitable arms breaks down within the Commonwealth under the weight of rapidly increasing demands. It is therefore merely a question of practical policy. Resistance should be raised to the universal provision of Carne arms for men who will need to use their arms in manual work. In the past these arms have been imported from America by an astoundingly clumsy process at the cost of something like £40 apiece, while a highly useful Amar arm can be made in Australia for approximately £12 10s. Whether the arms are provided in England or in Australia, two essentials should be fulfilled. The choice of the arm should be left to the medical officer responsible for the care and treatment of the man, and provision should be made for an adequate supply of every well-known type of arm. The cost of the arm should be taken into consideration, and as far as is practicable those types on which royalties have to be paid, should be avoided. The man should be given an arm which will enable him to earn a living, and as soon as it has been fitted to his stump, training to its use should be commenced. This training should be continued under the supervision of an expert, assisted by the medical officer, who would be responsible for the suitability of the prothesis. In the last place, we would urge that preference should be given to Australian workmanship in the manufacture of artificial limbs. Many legless and armless men can be trained to this work and in this training, it should never be forgotten that for a generation their skill will be required in the interests of themselves and their fellows in misfortune. If inventive genius is to be rewarded, as it should be, let the reward come to the Australian who exercises ingenuity for the benefit of his own kith and kin.

PLATES ILLUSTRATING DR. BALCOMBE QUICK'S ARTICLE.

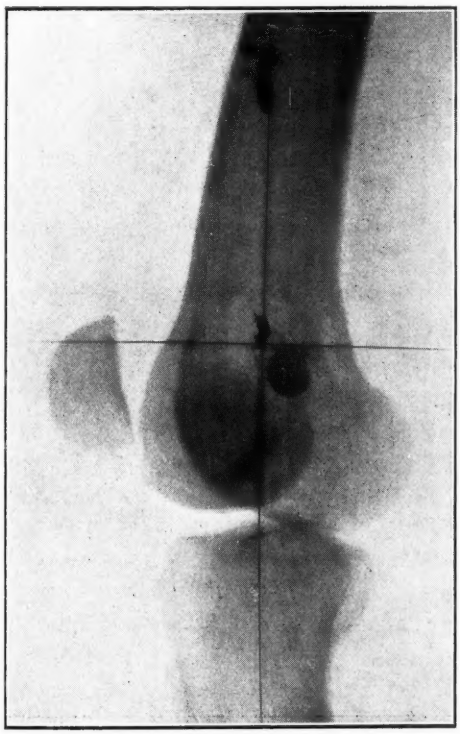
I.

Wound of entry size of threepenny piece. Infection. Note crack in femur. Recovery—ankylosis. Method 5.



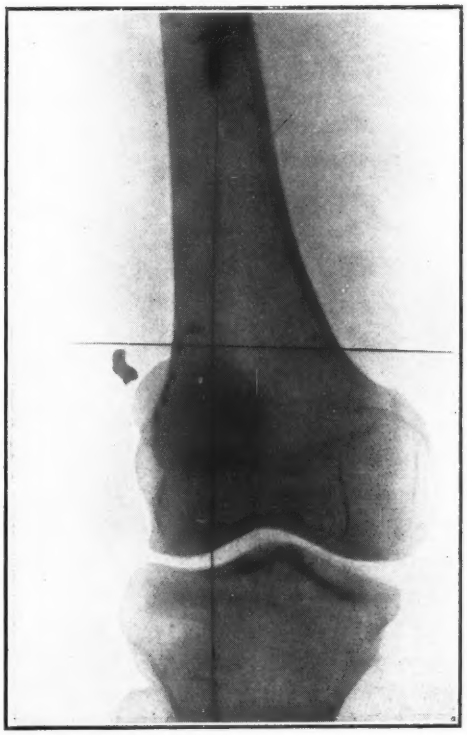
II.

Shrapnel bullet free in joint.



III.

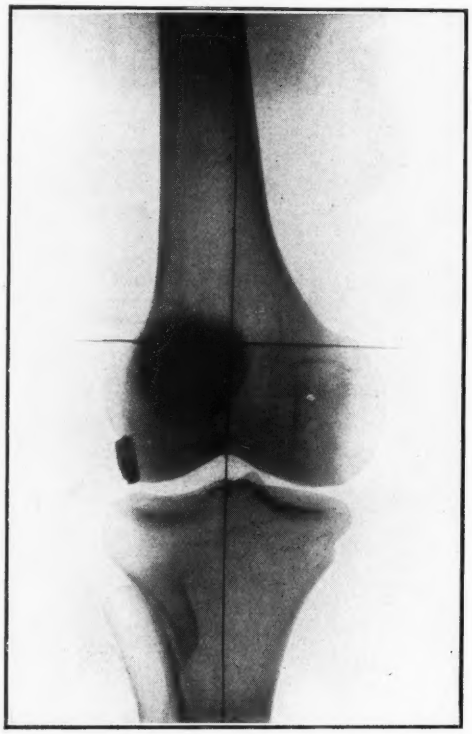
Shrapnel bullet in lower end of femur. The fragmentation of the bullet is often still more marked.



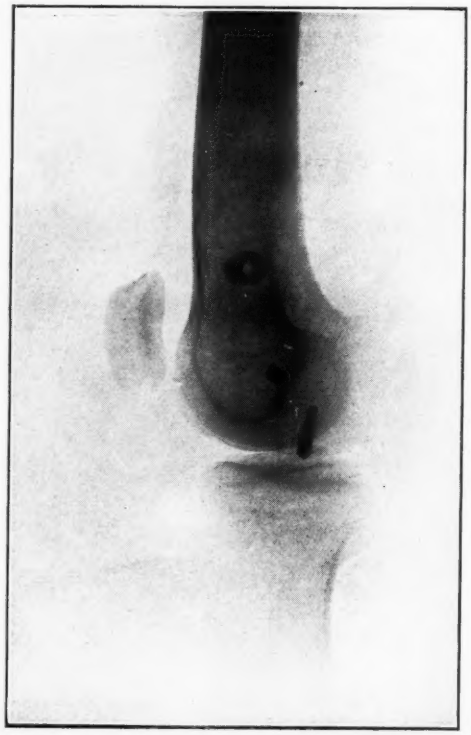
IV. *(a)*.

Foreign body free in knee joint. The fluid was turbid with leucocytes but sterile on culture. No culture made of foreign body. Uneventful recovery after lavage of joint and tube down to synovial membrane only.

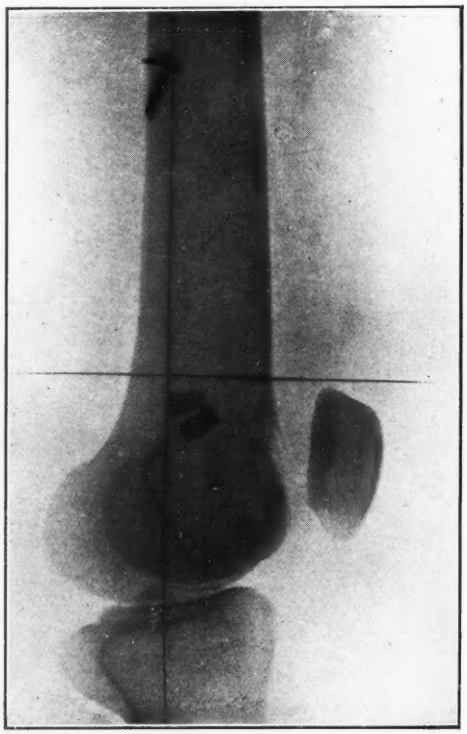
IV. (*b*).
The same as IV. (*a*).



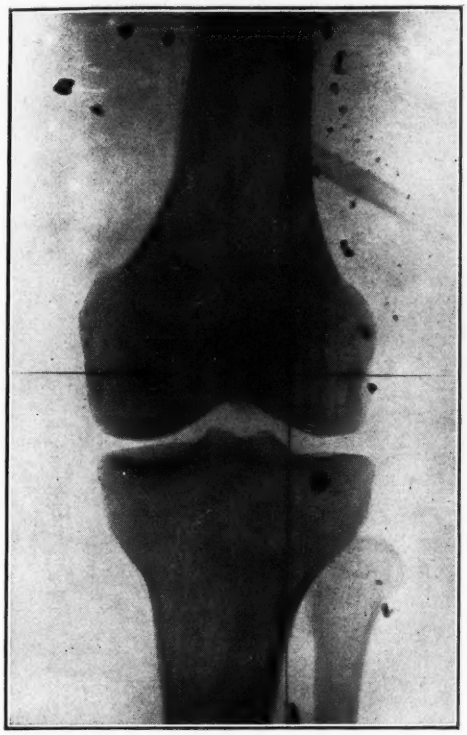
V. (*a*).
Two foreign bodies imbedded in outer condyle. Recovery with ankylosis after arthrotomy by Method 7.



V. (*b*).
The same as V. (*a*).

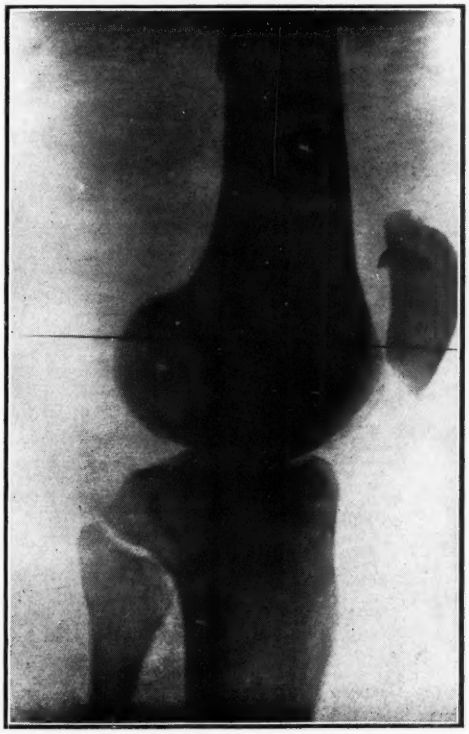


VI.
Showing the splitting up into two fragments of one piece of shell after entering femur.

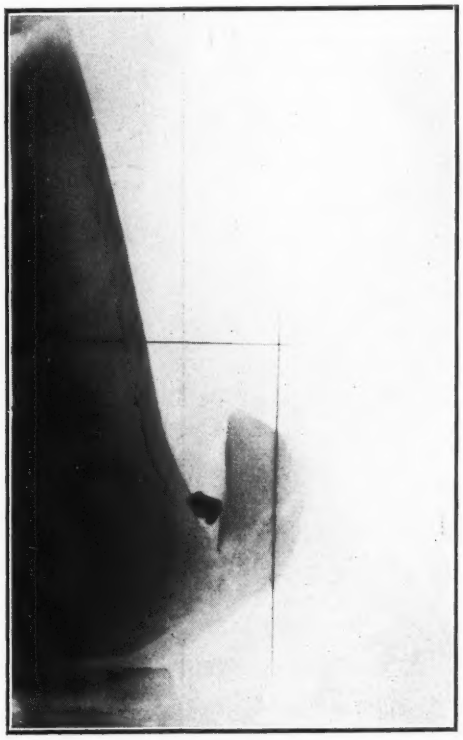


VII.
Multiple small fragments in and about knee joint.

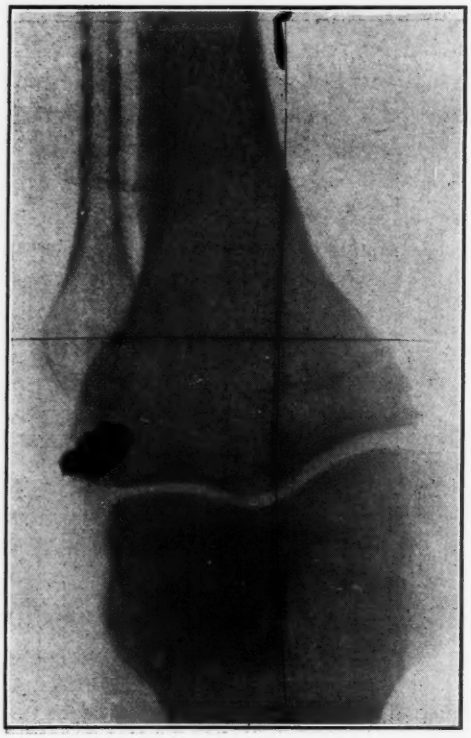
VIII.
Wound of ligament of Winslow.



IX.
Limited fracture of patella with foreign body in situ.

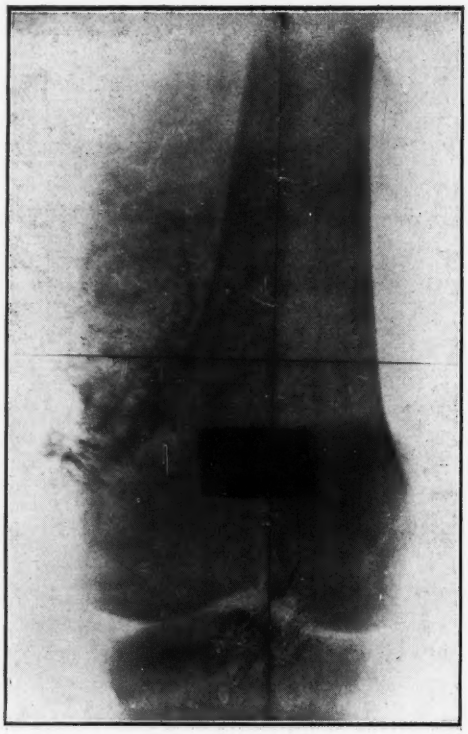


X.
Fragmentation of patella. Complete excision. Joint closed.



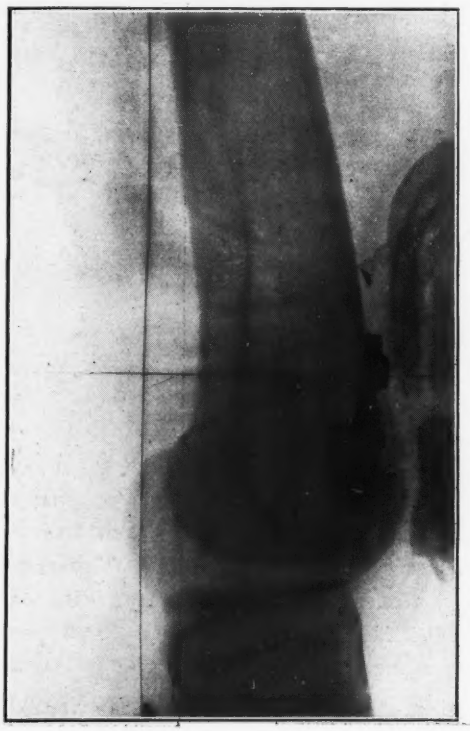
XI.

Foreign body in outer tuberosity. Excision of damaged bone with gouge. Transverse arthrotomy. Recovery, ankylosis with some tendency to in-knee.



XII.

Large foreign body in joint causing T-fracture. Note shadow due to bismuth-iodform paraffin paste. Excision of knee.



XIII.

Large foreign body imbedded in lower end of femur. Infraction, with much bruising of cancellous tissue; and infection.

THE PORTEUS TEST.

The better detection and control of the mental defective has been urged in these columns on many occasions. It has been pointed out that there are few matters which have a more far-reaching importance to the nation than the problem of the individual whose mental development has been arrested before every quality ensuring a sense of responsibility and the exercise of adequate restraint, has been completed. The education authorities appear to rest content when some provision has been made, at a relatively low cost, for the care of manifest mental deficients. The obvious idiots and imbeciles, too, are usually placed under restraint, at times even in the madhouse. But the much more common case of an individual whose intellectual powers are nearly but not quite normal and whose conduct may at any moment be governed by an irresistible impulse with disastrous results, is left untouched, or when some event forces the abnormal nature of the individual's mind to the notice of the public, is mistaken and wrongly handled. It has been estimated that 5% of school children should be classed among mental defectives. This figure is so appallingly high that few persons are prepared to accept it. Whatever the actual frequency of mental deficiency is among the general population, it is certainly vastly higher than the education authorities believe. Much has still to be learned concerning the psychiatry and pathology of these defects. A group classification has yet to be worked out on practical lines and the characteristic attributes of the various types of the high grade moron have yet to be studied. It is, however, established that unbridled exercise of animal faculties is associated with this condition and may lead to the ruin of the life not only of the individual and his progeny, but also of strangers with whom he may come in chance contact. Sexual perversion, sexual precosity, leading to sadism and other forms of violence, and want of self-control, manifested in theft, assaults, murders and other crimes, and often detectable in the confirmed alcoholic, are usually dependent on an abnormal development of the mind. The effects of mental deficiency are so extensive and so serious that its adequate control should be the first consideration of a responsible government.

Before anything can be done to check the evil, it is absolutely essential that its detection should be rendered possible in all parts of the Commonwealth. Professor R. J. A. Berry and Mr. S. D. Porteus, as the readers of this journal are well aware, have been occupied for a considerable time in an investigation of the physical, social and psychical characteristics of the mentally deficient child. In a powerful and highly suggestive lecture delivered before the Royal Society of New South Wales on May 12, 1918, Professor Berry described in detail the results of the measurements of cubic capacity of brain which he and his colleague had made in normal and abnormal children and young people and claimed on the basis of much evidence that this method in competent hands was capable of giving the indication for further signs of mental abnormality. He proposed that the proper application of his method should be directed toward the detection of the social inefficients of post-school life. These measurements are not to be regarded as the infallible proof of mental deficiency. Other means must be applied before the diagnosis can be confirmed. The power of learning and the general comportment of the child must be taken into account. Habits must be studied and any tendency to precocious development of the animal faculties noted. In addition psychological tests are to be employed. These include the well-known Binet-Simon test and its improved modifications by Goddard and by Terman, which yield a guide to the intellectual propensities of children in varying stages of education. In addition there is another test of great value in this study, which should be used side by side with the Binet-Simon test. This is the Porteus test. Notwithstanding the fact that Mr. S. D. Porteus, the inventor of this test, is an Australian, it is scarcely known in the Commonwealth but is extensively used in the United States of America. It is of great value in the hands of psychologists who have studied its employment and have learned to modify its application, according to the mental characteristics under investigation. In February, 1916, we pointed out that this test provided a measure of the capacity of prudence, of foresight, of general mental alertness and of the power to profit by experience. It does not depend, as the Binet-Simon test does, on previous education;

it can be applied to a child that has never been taught anything of school work. It is so constructed that the average individual will not be able to commit the solution of the individual tests to memory and thus falsify the results on a subsequent application. For each year of life from the age of three to the age of thirteen a maze has been drawn. The maze which the normal child of three years can master, is a very simple path along which the child passes the point of the pencil. The tests for each succeeding year become more and more complicated, until the thirteen year old test represents an intricate maze with one outlet and several blind ends. The child is told to look at the figure and when it sees what is required and how it can be done, to draw with the pencil a line from the centre to the outlet along the paths. There may be no turning back and seeking a better way. Three trials are permitted according to the instructions. The time occupied in observation should be noted; much can be learned from the manner in which the child sets about its task. Lack of method is revealed during this preparatory stage. Precipitate action, indicating want of prudence, is detectable when the pencil is applied before the eyes have discovered the proper way out. The faculty of memory can be tested when an error is made early and is not discovered for some time. Failure may be due to one or more of several causes and it is the task of the psychologist to discover the chief or only cause, when failure occurs. The mazes have been constructed with much skill and ingenuity and the gradations are sufficiently accurate for the purposes of the test. A persons of 16 years who solved the riddle of the ten year old maze, has difficulty with the next maze and fails when attempting to find a way out of the thirteen year old maze, has a mental development retarded from three to four years. Many of these boys and girls are of the type that calls for the greatest care. The practical value of the test has been established in many thousands of living children.

The next problem to be solved is that connected with the application of these tests. Who shall apply them? It is waste of time, energy and money to give them to the untrained school teacher or even to the medical practitioner who has had only a superficial education in psychiatric methods. It is equally useless to engage the services of a competent psychologist and to ask him to test children at the rate of one in five minutes or less. Each child must be studied and when necessary the records of the schooling must be examined as well as the child. The difficulty met at the start is that there are not enough persons trained to this form of work in the Commonwealth to examine more than a very few of our children. It therefore becomes necessary that large numbers of intellectual observers should be specially trained for the purpose. In a subsequent article the methods of this training will be discussed.

HOSPITAL ADMINISTRATION.

An announcement was made on June 13, 1918, by the New South Wales Government that a committee, to be known as the Hospital Advisory Committee, had been appointed with the object of enquiring into the question of the future organization of hospital work throughout the State. The programme includes the co-ordination of the activities of the hospitals and the prevention of overlapping. This may entail the closure of certain institutions. The second subject mentioned is the question of finance and the administration of the aid extended by the Government to hospitals. The Committee is also to take into its purview the classification of hospitals, the exercise of economy in administration, the provision of Government representation on the boards of management, the extension of industrial contribution schemes for country hospitals and for subsidized doctors, the adoption of a uniform system of keeping accounts and lastly the preparation of plans for hospitals and the selection of sites.

The Committee presumably will make searching enquiries into the subjects referred to it and will report to the Minister the results of its deliberations. In view of the fact that the organization of hospitals and their administration are matters which affect the medical profession which gives honorary service to the patients in hospitals, it is reasonable to assume that the Committee will seek guidance of the New South Wales Branch of the British Medical Association. This course is rendered advisable by the fact that the members of the Committee are

experts in several branches of public health administration, but not in hospital work. The decisions arrived at by this Committee will be valuable only if its members are wise enough to listen to the counsels of those members of the medical profession who have acted as hospital surgeons and physicians for many years and who have had first hand experience of the working of hospitals from inside. It is true that the Department of Public Health keeps a sort of general control over many of the hospitals, in view of the monetary aid extended by the Government to these institutions. This control entails a certain amount of knowledge of the manner in which the boards of management conduct the affairs of the hospitals. Beyond this slight practical acquaintance with hospital matters, the public health officials have in their official capacity no intimate relations to the hospitals at all.

The members of the Committee are Dr. R. T. Paton, the Director-General of Public Health, Mr. E. B. Harkness, the Under-Secretary of the Department of Public Health, a permanent official of sound common sense and undoubted skill in administration, Dr. W. G. Armstrong, the Senior Medical Officer, whose opinion on matters of epidemiology and hygiene is widely recognized and valued, Dr. G. H. Taylor, the Medical Officer of the Railways and Tramways, an expert of high standing in ophthalmology and in many of the associated branches of medicine, and lastly Dr. Richard Arthur, M.L.A., a practitioner who has established for himself a reputation of being an ardent advocate for many social reforms.

INTERNAL DISINFECTION.

Attempts have been made to kill bacteria within the bodies of infected animals by means of drugs, ever since it was rendered probable that the presence of these micro-organisms induced disease. Such attempts have usually ended in failure, though Morgenroth and others achieved some success with ethyl-hydro-cuprein in septicæmic infections of the pneumococcus. Shortly after his researches upon the ætiology of anthrax and upon the germicidal activity of perchloride of mercury, Koch endeavoured to treat animals rationally and effectively by intravenous injections of mercuric chloride. His failure demonstrated the very considerable reduction of the disinfecting power of perchloride of mercury in the presence of even low concentrations of proteins. Twenty years later it was found that the bacillus of diphtheria was killed in broth containing one part of the extremely powerful germicide, tetrachlor-ortho-biphenol in 320,000 parts of broth, while the bacillus grew freely in blood serum containing one part of the disinfectant in 10,000 parts of serum. Further investigations have established that much higher concentrations of germicides are needed, in general, for the disinfection of material containing proteins than are required for preventing growth in broth or solutions containing traces of albuminoids. Recently, however, attention has been directed to the antiseptic action of a series of acridine derivatives in which methyl groups are substituted, either in acridine itself or its amino-products. These substances, which include flavine and the dye, acridine yellow, possess a bactericidal action enhanced by serum.

In the presence of serum this group of substances constitutes the most potent germicidal agents known. So far, the members of this series share with no other class of chemical compounds the property of an antiseptic action augmented by proteins. The germicidal activity of these substances is slowly progressive, so that the maximal effect is not obtained for many hours. If perchloride of mercury is added, in increasing proportions, to a series of tubes containing *Staphylococcus aureus* and serum, it is found that the micrococci multiply unless they are killed within two hours by the perchloride of mercury. The concentration of the acridine derivative, trypaflavin, needed to kill staphylococci under similar conditions in two hours is roughly identical with that of mercuric chloride, but only one-twentieth of that concentration of trypaflavin will kill the cocci in twenty-four hours. Diamino-acridine sulphate possesses a similar delayed germicidal activity.

Some studies[1] have been made by C. H. Browning and R. Gulbransen on the bactericidal properties conferred upon blood by the intravenous injection of diamino-acridine sulphate, in order to demonstrate the feasibility of "internal disinfection." These authors have shown that the lethal dose of diamino-acridine sulphate for a mouse, weighing 20 grammes, is three milligrammes, while the concentration of the drug which destroys *Bacillus coli communis* and *Staphylococcus aureus* is 1 in 100,000. With trypaflavin, the toxicity for the mouse is five times greater than with diamino-acridine sulphate. The toxicity has also been tested once upon a monkey, which received with safety 0.7 gm. per kilo. of body weight. Some experiments have also shown that the phagocytic activity of leucocytes is only slightly impaired in a concentration of one part of diamino-acridine sulphate in 10,000 of mixture.

The principal experiments consisted in introducing diamino-acridine sulphate dissolved in physiological saline solution into rabbits and in withdrawing specimens of blood at intervals. The serum obtained from this blood was infected with a culture of *Staphylococcus aureus* or *Bacillus coli communis* and incubated at 37° C. for some days. The serum obtained from blood drawn two hours after injection, remains quite clear after inoculation and incubation. The serum obtained from blood taken thirty minutes after injection of a dose of 0.07 gm. per kilo. is bactericidal when diluted with three volumes of normal serum.

[1] *Proc. Roy. Soc., London*, Series B, Vol. XC., p. 136, April, 1918.

Since it might be suggested that the bacteriolytic powers of the rabbit's serum might account for the germicidal properties, the experiments were repeated, so that the serum could be heated to 60° C. before injection. The results obtained were identical with those noted with unheated serum.

It would thus appear that concentrations of diamino-acridine sulphate which can be safely borne by mammals confer distinct bactericidal powers upon the blood serum. As the drug is eliminated by the kidney in about 48 hours, these substances should be useful urinary antiseptics.

BOTULISM.

During the months of March and April of the current year physicians in England found themselves called upon to deal with many cases of illness presenting an unusual clinical type. While the symptoms in these cases varied to a considerable extent, there was sufficient evidence to associate them into one group. The general character of the illness was that of an infective lesion of the central nervous system, and more particularly of the neighbourhood of the third nucleus. According to Dr. Arthur J. Hall[1] the illness began with signs of drowsiness and prostration, and at an early stage paralytic signs originating in the bulbo-pontine area manifested themselves. The most common nervous symptoms were ptosis, *ophthalmoplegia externa* and *interna*, nystagmus, facial palsy, disorders of speech and dysphagia. He sought to divide the cases into two groups, the meningitic and the asthenic. Dr. W. Harris[2] emphasized the fact that the illness is supposed to develope after an incubation period of from 12 to 24 hours. According to this observer, pyrexia was usually absent, but Dr. Hall found that many of his patients had fever. It was recognized that the condition corresponded very closely to botulism, that is an illness caused by infection with *Bacillus botulinus* introduced with canned or tinned food. Dr. John Matthews examined the contents of a tin of salmon, to which the illness in one case was traced, and discovered a large, gas-producing, anaerobic, Gram-positive and probably spore-bearing bacillus, which resembled the bacillus of van Ermengem. From other sources we understand that this bacteriological finding was confirmed in several cases. While the bacterium is well known, and its characters have been studied with much care, British physicians have had little opportunity of observing cases of infection in human subjects. One very puzzling aspect of the cases when they were first observed, was the absence of obvious indications that they were produced by the ingestion of contaminated foods. As soon as the true nature of the affection was discovered in the laboratory, the physicians were placed on their guard and were able to take a more intelligent view of the cases than before. At present it is known that the sausage bacillus produces its damaging effects by means of a toxic body which has a special affinity for nervous tissue. The explanation for the fact that the bulbo-pontine area is peculiarly susceptible to this poison is still lacking. Formerly isolated cases of this affection were treated with botulinus antitoxin, but unfortunately there was none available in England at the time of the outbreak.

[1] *The Lancet*, April 20, 1918.
[2] *Loc. cit.*

THE LATE MR. GUY ELLISTON.

From the issues of the *British Medical Journal* and *The Lancet*, of April 20, 1918, we learn with extreme regret of the death, at the age of 46 years, of Mr. Guy Elliston, the Financial Secretary and Business Manager of the British Medical Association. It is improbably that members of the Assocation, who have not had personal dealings with the head office in London, will realize the value of Mr. Elliston's services to the British Medical Association, extending over a period of nineteen years. He acted as Assistant Secretary to Mr. Francis Fowke from 1899, and succeeded him as General Secretary in 1902. In 1908, as a result of the recommendations of a Special Finance Enquiry Committee, the title of his office was changed to Financial Secretary and Business Manager, in order to emphasize the distinction between his duties and those of the Medical Secretary. He was a shrewd and capable business man, and obtained the recognition of the Central Council and Representative Body at an early date, through his judicious purchases of paper and through other excellent arrangements whereby he saved the Association large sums of money. The high opinion in which he was held was enhanced by the competent care and skill displayed at a time when a single ill-advised action would have resulted in the waste of thousands of pounds. The old home of the Association was no longer adapted to the needs of the great institution which bore the responsibilities of the medical profession throughout the whole Empire. A sound financial proposal had been worked out for the rebuilding of the offices in the Strand, and during the process of re-building, temporary premises had to be secured. The arrangements were left in Elliston's hands, and the two years' occupancy of the house in Catherine Street left the Association in no way less well-to-do. For many years he stood by the side of Mr. Edwin Rayner, the Treasurer, and not once was the advice tendered anything but sound. During this long association the finances of the Association underwent strange vicissitudes, and both the Treasurer and the Financial Secretary were frequently faced with anxious moments and heavy responsibilities. Not even the serious inroads produced by the large increase in expenditure to meet the difficulties created by the introduction of the Insurance Act of 1911 baffled him. He rose triumphant over all the difficulties and, by industry and foresight, he succeeded in re-establishing the stability of the finances of our great organization. His offices were excellently organized; work was never in arrears, and each member of the staff was adequately trained to his special duties. To strangers and friends alike Guy Elliston was always courteous and always helpful. To the Association he was a staunch support

and a source of strength. While those who were in constant touch with him at No. 429 Strand have lost a delightful companion and excellent friend, the whole Association has reason to mourn the loss of one of its most faithful workers.

Naval and Military.

CASUALTIES.

In the 408th list of casualties, which was issued to the public on June 13, 1918, there is an entry to the effect that Captain Eric MacAllan Gordon-Glassford, M.C., has been wounded for the second occasion and that Major Arthur Rose Clayton has been wounded. The name of Major Charles Herbert Wesley is included among the list of wounded in the 409th list of casualties, issued on June 15, 1918.

APPOINTMENTS.

The following notices have appeared in the *Commonwealth of Australia Gazette*, No. 87, of June 13, 1918:—

Australian Imperial Force.

Army Medical Corps.

Major W. M. McLaren, from 14th Australian General Hospital, to command Australian Camel Field Ambulance, and is granted the temporary rank of Lieutenant-Colonel whilst commanding. 21st January, 1918.

Captain S. H. Seccombe, from No. 1 Light Horse Field Ambulance, and is posted for duty with No. 14 Australian General Hospital, and is granted the temporary rank of Major. 12th January, 1918.

Major (temporary Lieutenant-Colonel) A. C. Arnold, relinquished the temporary rank of Lieutenant-Colonel on ceasing to command Australian Camel Field Ambulance. 20th January, 1918.

Major A. L. Buchanan, from No. 5 Field Ambulance, to command No. 2 Australian Auxiliary Hospital, and is granted the temporary rank of Lieutenant-Colonel whilst commanding. 18th February, 1918.

To be Majors—

Captains V. M. Coppleson, R. O. Douglas, D. M. Steele, M.C., and E. A. Guymer. 28th February, 1918.

THE BLIND AND THE DEAF AND DUMB.

The annual report of the South Australian Institution for the Blind and Deaf and Dumb for the year ending September 30, 1917, was submitted to the annual meeting on December 8, 1917, and has now been issued, together with other information, in book form.

During the financial year 10 pupils were admitted. One of these was discharged after a month, when it was found that he was an unfit subject for the institution. There were 70 pupils in the schools at the end of the year, including 26 blind children and 44 deaf and dumb. In addition, 13 deaf and six blind persons are employed at the Institution. During the course of the year 13 pupils left. Ten of them obtained employment, two returned to their homes and one was sent to the Angas Deaf and Dumb Home at Parafield. It is pointed out that the children are sent to the schools at an earlier age than formerly. In this way it is possible to give them a satisfactory education before they attain the age of 17.

The teachers and pupil-teachers are said to be working well, and satisfactory progress is being made in all the classes. Mr. H. Bertram, the music-master, reports good progress. The piano-playing of the pupils is satisfactory, and they are able to write music of complex construction. He points out that the taste for good music is very noticeable among all the pupils. Useful work has been done in the wood-work and drawing classes. The senior boys are taught elementary bootmaking and gardening, and the girls are taught dressmaking and various branches of domestic work. Some instruction in the nursing of the sick is also given. Gymnastics and physical training are found very useful for the purpose of keeping the children in good condition. The deaf boys play both football and cricket.

From the remainder of the report it is evident that the inmates of this excellent institution are receiving that guidance and help which are necessary to equip them for a life of usefulness. No praise can be too high for the disinterested and self-sacrificing teachers who devote all their energy and lavish affection on their afflicted chargelings.

Vital Statistics.

GREATER BRISBANE.

The following data are contained in the monthly returns of the Registrar General of the vital statistics of Greater Brisbane during the months of January, February and March, 1918. There were, 1,293 births, 670 of males and 623 of females. The birth-rate expressed as an annual rate works out at 29.8 per 1,000 of population.

The total number of deaths registered in the metropolitan area was 527. These included 291 of males and 236 of females. One hundred and five of the deaths were of infants under one year of age. The general death-rate is equivalent to an annual death-rate of 13.14. The infantile mortality works out at 81.05 per 1,000 births. In the corresponding quarter of 1917 there were only 416 deaths, *i.e.*, 111 less than in 1918. The number of infants under one year of age who died in the first quarter of 1917 was 66.

The statistician records the fact that there were 87 illegitimate infants born, which is practically equal to an illegitimate birth-rate of 0.5 per 1,000 of population.

The information concerning the causes of death is not given in full detail. From the data available, it appears that there were 93 deaths from diseases of the cardio-vascular system, including 14 of cerebral hæmorrhage and 25 from Bright's disease. There were 57 from diarrhœa and enteritis, 35 deaths from tuberculosis, 10 from pneumonia, 7 from broncho-pneumonia, 6 from diphtheria, 5 from enteric fever, three from septicæmia, three from syphilis, three from meningitis, two from tetanus and one from scarlatina. Of the non-infective processes, cancer heads the list with 56 deaths, while diabetes caused six, purpura four and leukæmia, alcoholism and lead-poisoning one each. The only deaths associated with the puerperal condition were four from eclampsia.

SOUTH AUSTRALIA.

The vital statistics for South Australia for the months of January, February and March, 1918, have been published from time to time in the *South Australian Government Gazette*. The total number of births was 3,874. Calculated on the basis of the population estimated on January 1, 1918, namely, 435,640, the birth-rate works out at 24.4 per 1,000 per annum. The rate in January was above the average for the corresponding period of the previous five years, while the rate in February was just below and the rate in March well below the average. There are no figures published concerning the number of illegitimate births.

The number of deaths registered during the three months was 1,053. The death-rate expressed as an annual rate was 9.67. This rate is lower than that recorded in the first quarter of the previous five years. The number of deaths of infants under one year of age was 181. The corresponding infantile mortality rate was 59.88. The number of persons who had attained their 80th year before death, was 105.

Of the 1,053 deaths, 143 were due to diseases of the cardio-vascular system, while 33 were due to Bright's disease, three to alcoholism, three to chronic rheumatism and 12 to diseases of the liver. There were 84 deaths from tuberculosis, 82 from diarrhœa and enteritis, 35 from pneumonia, 14 from diphtheria, 10 from meningitis, 8 from enteric fever, 8 from dysentery, 6 from tetanus, 4 each from influenza and erysipelas, 3 from non-puerperal septicæmia and one each from scarlatina and pertussis. Only three deaths were registered from puerperal septicæmia. There were 102 deaths from cancer, 21 from diabetes and nine from leukæmia and other forms of anæmia.

The statistics for the city of Adelaide show that there were 256 births, which is equivalent to an annual birth-rate of 25.92 per 1,000 of population. The total number of deaths, exclusive of those in public institutions of persons not usually resident in the city, was 161. On the estimated population of 39,474, this would yield a death-rate of 16.26 per 1,000 of population. The causes of death do not call for any special comment.

Abstracts from Current Medical Literature.

OPHTHALMOLOGY.

(215) Localization of Foreign Bodies in the Eye.

Radiography is usually confined to one plane, one plate being used, or two plates used successively, occupying the same position; the cross-thread system is one of the best methods, and is based on the comparison of similar triangles. E. M. Eaton emphasizes the importance of efficient head fixation, and eye fixation, and the position of the plate, which should be parallel to the optic axis (*British Journ. Ophthalmology*, December, 1917). The points from which the two radiograms are taken should be definitely known in their relationship to each other, to the plate, and to the cross wires. The guide-body is also fixed in an accurately measured position. For convenience, the anodes should be vertically over one of the wires and equidistant from the other; a displacement of 6 cm. is the most suitable. The anode should be from 40 to 50 cm. distant from the plate. When the two radiograms have been obtained, they may be interpreted by using geometrical construction, by arithmetical calculation, or by the use of formulæ. The error should not exceed half a millimetre. These methods are described in some detail. The author then proceeds to discuss Sweet's methods, which are based on totally different principles. Of his later modification, an account of which may be read in de Schweintz's "Diseases of the Eye" (8th edition), the author expresses high appreciation, though so far he has not used it. One marker only is used, also a reflector and telescope, for setting the marker in one plane, and a perforated mirror for fixing the line of vision. No provision, however, is made for the error due to the angle γ. Sweet's older method, which is in very general use, is briefly described, and comes in for much adverse criticism. The projection in the vertical axial plane of the first photograph, to be correct, assumes that the rays through the marker and foreign body are parallel, whereas they are divergent; and the same objection applies to the projection into the equatorial plane. The usual charts prepared, representing the vertical axial, horizontal axial and equatorial planes, are useful for recording purposes, but as interpreters of the position of the foreign body they may be most misleading. For instance, a point may be charted 20 mm. behind the cornea, 6 mm. above the axis and 7 mm. to the nasal side, and yet its true position is outside the eyeball. To determine if a foreign body is within the eye or not it is necessary to have its distance from the centre of the sphere to compare with the radius, or its distance from the geometric axis, together with the radius of the equatorial section actually containing the foreign body. By a simple application of the theorem connecting the hypotenuse of a right angle triangle with its sides, working in vertical and horizontal planes, it is easily deduced that the distance of a point from the centre of the sphere is the square root of the sum of the squares of its lateral eccentricity, its vertical eccentricity, and its distance behind the centre. This distance, subtracted from the radius, gives its distance from the circumference. If positive it is inside, if negative outside the sphere. More convenient is the radial method. In an equatorial section at the level of the foreign body, the distance of the point from the centre of this section is obvious' the square root of the sum of the squares of the vertical and lateral eccentricities. This distance subtracted from the radius of the section at the foreign body level gives the distance of the point from the periphery, and determines whether it is within or without the sphere. A table is prepared giving, as the result of experiment, the radius of equatorial sections of the human eye at every half millimetre behind the cornea. Another table gives the square root of the sum of the squares of all the necessary numbers. Allowance must be made for gross refractive error when the point is in the posterior segment of the eye, for each three diopters of myopia the point is 1 mm. further forward (but it must not be brought across the equator), and for 3 D. of hypermetropia, 1 mm. further backwards. As an alternative to arithmetical calculation or the use of the tables, the author has devised two charts whereon the position of the foreign body may be determined by geometrical construction. One chart represents a radial section and the other an axial section, but in each case the section is the particular one in which the foreign body lies, thereby avoiding the fallacies attending projections into other planes.

(216) Iritis and Cyclitis in Dysentery.

E. M. Maxwell and W. H. Kilp report six cases of intra-ocular infection in dysenteric patients, all from the Mediterranean area (*British Journ. Ophthal.*, February, 1918). The first patient was a young private, whose dysentery was complicated with arthritis. Four weeks after the onset he noticed failing sight in the right eye. After dilatation the papillary area was filled with a membranous exudate, a number of fine opacities and uveal pigment. They largely cleared up. The second patient also developed arthritis as well as iridocyclitis on both eyes. The pupils failed to dilate with atropine owing to a complete ring-synechia in the right eye and an almost complete one in the left. Iridectomy was done in the right eye. The third man developed intense ciliary and episcleral hyperæmia on the thirty-sixth day, also vitreous opacities. Anti-dysenteric serum (Shiga) was administered with excellent result. The pain, photophobia and infection rapidly subsided and the pupil dilated well. This patient also had arthritis. In the fourth case the iritis was binocular, with deposits on the lens capsule. There was no arthritis. In the fifth case both eyes were affected. Dust-like opacities were seen in the vitreous, and atropine had to be pushed to keep up dilatation. The sixth patient suffered from arthritis and iritis in both eyes. He gave no history of dysentery, but his blood serum agglutinated *B. dysenteriae* (Shiga).

(217) Heterochromic Cyclitis.

E. C. Ellett reports twelve cases illustrating the syndrome to which Harrison Butter has given the name heterochromic cyclitis. (*Archives of Ophthalmology*, November 1917). The irides are of different colour and the pathological changes are almost invariably observed in the lighter-coloured eye. These changes consist in: (1) a chronic low-grade cyclitis; (2) a cataract; (3) simple glaucoma. The last change does not always supervene, and the cataract in many cases is operable. The cause of this condition is unknown, though it has been considered to be a lesion of the cervical sympathetic. Lutz reported 17 cases; in 13 the age was below thirty. The author's cases are classified thus: 3 cases of heterochromia iridis with uveitis; 2 cases with cataract; 2 cases with cataract and glaucoma; 5 cases of uveitis with some attendant discolouration of the iris, and glaucoma.

(218) Glaucoma and Herpes Zoster.

John E. Weeks reports three cases of increased ocular tension, accompanied by *herpes zoster frontalis* of the same side. (*Archives of Ophthal.*, September, 1917). The sensory supply of the eyeball is almost wholly derived from the nasal branch of the supraorbital division of the trigeminal nerve. When the eyeball is affected by some nerve lesion, the skin over the side of the nose is also affected, as would be expected. It has been established that in all cases of inflammation of the uveal tract the aqueous humour undergoes certain changes which prevent its free passage into the channels of egress. In the author's opinion this was the cause of the high intraocular tension in his cases. The cases were all unilateral, all the patients had herpes, and in all the nasal branch of the fifth nerve was involved. Operation was considered advisable in the three cases.

LARYNGOLOGY AND OTOLOGY.

(219) Nose and Ear in Epidemic Influenza.

Influenza, especially the epidemic variety, is regarded by J. S. Davis (*North-West Medicine*, November, 1917) as one of the commonest causes of sinus affections. Symptoms of coryza, headache, generally frontal, and often tenderness over the eye (even when the frontal sinus is not implicated) are the

usual symptoms of sinus disease. The affection develops in the following order: maxillary, ethmoid, frontal, sphenoid. A severe early morning headache, improving in the day-time or after drainage from the sinus, indicates frontal involvement. Tenderness may be important when comparing the affected with the opposite side, but not helpful in the case of the maxillary. Pain begins with symptoms of heaviness or pressure, and changes from time to time, being often neuralgic, and usually augmented by coughing, sneezing, nose-blowing, etc. Pain and headache in the orbit and over the frontal sinus and anterior portion of the nose, seem to be characteristic of negative pressure. Absence of headache does not eliminate sinus disease. Hyperæmia and swelling of the middle nasal fossa is a constant symptom, and occlusion of the nares frequent. Pus may be present but is not necessarily always indicative of the existence of sinus affection. Trans-illumination and X-rays are of questionable diagnostic value, especialy if negative. The result of vaccine treatment is doubtful. In subacute and chronic localized infections, and particularly in acute exacerbations of these conditions, specific vaccines, autogenous in preference to stock, when properly used, appear to have value in the production of antibodies and by stimulating leucocytic and other activities. Free drainage, secured by local medication or surgical measures, is the first desideratum, with caution in the use of douches and sprays. *Otitis media*, the next common of the complications of influenza, unlike sinusitis, is more common in children than adults, probably due to a difference in the anatomical relations, the Eustachian tube being shorter and more horizontal in the child, while in the adult it is longer and rises obliquely to reach the tympanic cavity at a considerably higher level. The tympanic floor of the child is on a level slightly below that of the nasal floor, while in the adult it is above the floor of the nose. The pharyngeal mouth of the child's Eustachian tube is on about the same level as the hard palate, whereas in the adult it is above it. Children with acute *otitis media* often have severe cranial symptoms resembling meningitis, which readily clear up after myringotomy. Both ears should be examined, particularly in children, as *otitis media* may exist without pain, especially in streptococcal infection, which latter is the commonest cause of mastoid involvement and cranial abscess. Neumann, of Vienna, is quoted as advising paracentesis if one of the following symptoms, headache, fever, pain in mastoid, pain on pressure or cranial symptoms, exists with two of the following minor symptoms pain in the middle ear, bulging of the drum, or diminished hearing (less than one metre for whispered voice). Incise freely at the most prominent point if bulging, otherwise in the lower posterior quadrant or posterior half. It has been claimed that 20% of the cases of influenzal otitis media are complicated by mastoiditis. The following conditions call for surgical interference: (1) Long-standing acute middle ear suppurations where symptoms of pus retention and toxic absorption supervene. (2) Cases of acute mastoiditis characterized by pain, which becomes intensified on pressure over the antrum, the tip, the mastoid emissary vein or the posterior osseous meatal wall; by fever which is persistent, especially in children after paracentesis; and by a sinking of the posterior superior meatal wall or a narrowing of the lumen of the external auditory canal. (3) Cases of acute middle ear suppuration with nausea, vomiting, dizziness or facial paralysis; or with symptoms of intralabyrinthine or intracranial involvement supervening. (4) Cases of subperiosteal abscess.

(220) Circumcision of the Tonsil.

A persistent *plica triangularis* prevents a normal draining of the tonsillar crypts and peritonsillar spaces. Frank G. Murphy's method of dealing with this redundant structure is set out in the September, 1917, issue of the *Laryngoscope*. The *plica* may be described as a curtain covering the anterior portion of the tonsillar fossa. It is attached to the free posterior edge of the anterior pillar in front, to the anterior border of the posterior pillar above, and to the side of the tongue below. Its posterior border is free above in the supra-tonsillar space but adherent in its lower half or more to the tonsil. Thus is formed a fossa extending downwards between the anterior pillar and tonsil forming a veritable culture tube for pathogenic bacteria that may infect the peritonsillar glands whose ducts open into this area. The removal of the portion of plica forming the inner wall of this *cul de sac* is the object of the operation. A cotton-tipped probe saturated with a solution of 10% cocaine and 1:1000 adrenalin is applied to the median side of the portion of plica to be removed, and then inserted into the supra-tonsillar fossa and down into the anterior fossa described above. Applications, four to six in number, are in this way made to each side of the plica every five minutes. Then with the U-punch incisions are made from above forwards and slightly downwards to the anterior pillar and then downwards to the bottom of the fossa. The remaining free portion of plica are then nibbled off with a Hartmann punch. The application of a 25% tincture of iodine is then made to the field of operation and repeated daily for a few days. If the tonsil does not begin to function normally, and no improvement follows in the patient's systemic condition, enucleation of the tonsil is recommended.

(221) Hearing After Labyrinthectomy.

Arthur B. Duel (*Journ. Laryng., Rhin., Otology*, October, 1917) relates the history of a married woman aged 60 years, who complained of distressing tinnitus, a monotonous humming around the outside of the head, with intervals of a thumping sensation on the right side of the head. This was so severe that the patient required doses of morphine. She had slight deafness following enteric fever at 18 years. At 35 years she first noticed head noises, described as "escaping steam." Hearing gradually became impaired, and noises persisted, in spite of treatment. Division of adhesions about the ossicles of the right ear, lumbar puncture, and ossiculectomy of the right ear gave no relief. The Wassermann test was negative. She had never had *paracusis willisi*. After noting all the necessary tests, a complete labyrinthectomy was performed on the right side. This failed to influence the tinnitus, and three months later she was indubitably proved to have hearing on that side. Six months after the first operation a second operation was performed. Prior to operation the most elaborate functional tests were made, and it was again demonstrated that the patient could hear words shouted on the operated side, the other ear being stopped by a noise apparatus. The cochlear cavity was found to be apparently clear of any vestige of cochlear apparatus, and the vestibula and the ampullæ of the semicircular canals were then destroyed. When the wound had thoroughly healed the patient still persisted that she could hear sounds, though not words, in the operated ear, the noise apparatus being used on the opposite side. The point raised was whether destruction of the cochlea destroyed hearing.

(222) Prophylactic Tonsillectomy.

"Universal tonsil enucleation would put half the laryngologists and children's specialists out of work"—Wilson Johnston, quoted by Michard W. Perry (*North-West Medicine*, November, 1917). The latter would have every tonsil removed at four years of age irrespective of its condition, or as much younger as infection may indicate. He is of opinion that the tonsil was originally a lymphatic gland completely enclosed in its capsule, but that it has, in the process of evolution, through a developmental defect, been extruded through its capsule and the faucial pillars, become exposed to contamination, and undergone irritative hyperplasia. The retention of its powers of absorption, together with its profuse and intricate lymphatic connexion with the heart, renders it a weak spot in the defensive armour of the body. Nature tries to repair this error, in time, by permitting its atrophy and replacement by scar tissue. He insists that there is scarcely an ailment produced by either acute or chronic infection in which the poison may not find an entrance through this channel. There is no direct evidence that it has any function, and there is no reliable evidence that its removal has any deleterious effect on the general system, but abundant proofs that the results are in many ways decidedly beneficial. Early removal gives early protection again infectious diseases, acute and chronic, and the operation is simple in direct proportion to the youth of the patient, and safe in direct proportion to its simplicity. Enucleation in the "head down" position, under ether anæsthesia always, is recommended.

British Medical Association News.

SCIENTIFIC.

A meeting of the Western Australian Branch was held at the Perth Public Hospital on May 15, 1918, Dr. R. C. Everitt Atkinson, the President, in the chair.

Dr. J. K. Couch exhibited (*i.*) a radiogram of fractured metacarpal bone of the right and left thumbs—the injuries were sustained during boxing; (*ii*) a radiogram of shrapnel of the right shoulder joint—in this case the pain had been referred to the left shoulder; (*iii.*) a photograph illustrating dislocation of the wrist. He also showed two cystoscopes (Otis Brown model). The first was a flushing cystoscope giving a direct instead of an inverted view, and the second was a direct cystoscope which could also be used as a urethescope. In the last place, he exhibited Bárány sound-producer, used in the quantitive determination of hearing.

Dr. F. Gill read the notes of a case of osteomyelitis of the tibia and produced the temperature chart. The patient, a child, had been treated by the Carrel-Dakin method, with excellent results, and had been discharged from hospital 16 days after the bone had been opened up. Dr. Gill also showed a splint of his own design for use in cases of fracture of the humerus. The splint was based on the principle of Middeldorpf triangle. It consisted of a wooden triangle attached to a wire frame, which was passed over the shoulder and was fixed around the chest with a band.

Dr. W. Trethowan considered that the patient with osteomyelitis had been exceedingly lucky in not having sustained any necrosis of the tibia. He congratulated Dr. Gill on his ingenious splint.

Dr. J. K. Couch read a paper on hæmorrhoids and their treatment. We hope to be able to publish this paper at a later date.

MEDICO-POLITICAL.

An extraordinary meeting of the New South Wales Branch was held on June 14, 1918, at the B.M.A. Building, 30-34 Elizabeth Street, Sydney, Dr. A. A. Palmer, the President, in the chair.

Dr. R. H. Todd, the Honorary Secretary, moved on behalf of the Council:—

> That no member shall notify other members of the profession by means of a circular letter or otherwise that he practises or intends to practise as a specialist in any particular branch of medical science, provided that this restriction shall not apply in the case of a member who does not undertake the immediate care of patients, that is to say, who does not attend patients except on behalf of or in consultation with the medical attendants of such patients.

The Council of the Branch had had cause from time to time to guide members who wished to engage in specialist practice. In many of these instances a practitioner wished to announce to his colleagues that he was confining his activities to the clinical research work in the laboratory, and no objection had been raised to an announcement of this kind. On the other hand, the Council had arrived at the determination that it was undesirable for practitioners who were prepared to treat patients applying to them for advice, to advertise the fact that they proposed to practise as specialists. The Council had not encountered any difficulty in dealing with members, as they had been guided by the principle underlying the motion before the meeting. The Council thought that it would be well if members had a definite regulation dealing with this matter, so that in the future everyone would be aware of the proper course to take in the circumstances referred to.

The motion was seconded by Dr. A. J. Brady.

Dr. Gordon Craig said that ethical rules had to be framed for the production of the greatest good for the greatest number. He advocated the adoption of this rule, because he felt that if irregularities were allowed in one instance, there was no knowing where the licence would lead them.

The motion was put to the meeting and carried without dissention.

Dr. R. H. Todd, the Honorary Secretary, moved on behalf of the Council:—

> That no member shall permit or be party to the publication of any specialty practised by him, or of his hours of consultation, in any telephone "list of subscribers."

In presenting this motion he pointed out that the New South Wales Branch Council had received a communication from the Council of the Queensland Branch, enquiring whether any objection was taken by them to the publication, in the lists of telephone subscribers, of a specialty or of the hours of consultation of a medical practitioner. The Queensland Branch Council had been asked to deal with a specific case, and they had arrived at the decision that this means of advertisement was undesirable. The matter had not before been considered by the Council of the New South Wales Branch. He had made enquiries, and had discovered that, with the exception of one aurist, the only practitioners who announced a specialty in the book of telephone subscribers, were the ophthalmic surgeons. The Council had considered this matter, and had arrived at the conclusion that it was not in the general interests of the medical profession that any medical practitioner should notify the specialty he was practising in this publication. The Ophthalmological Society of New South Wales had been communicated with and he, in his capacity as Honorary Secretary, had received a letter from the Honorary Secretary of the Ophthalmological Society to the effect that his Council had considered the question, and had resolved that this practice, which had obtained for many years, ought not to be disturbed. He, the speaker, suggested that, as far as he was aware, there was no valid reason why ophthalmic surgeons should adopt rules of professional conduct different from those which governed the behaviour of the rest of the medical profession. He quoted Saundby's opinion that the only legitimate means of advertisement to the public was the practitioner's door plate.

In the course of a spirited discussion, it was urged by several ophthalmic surgeons that the practice of appending the term "ophthalmic surgeon" to a name in the telephone book was a harmless practice, and was of use to the public. The public was only too ready to consult opticians and other unqualified and untrained persons for affections of the eyes. The notice in the telephone book acted as a guide to patients. If the motion were carried it would act hardly on ophthalmic surgeons with common names, as the confusion between them and opticians of the same or similar names would be increased. It was further urged that the inclusion of the words did not constitute an advertisement, unless, indeed, it was admitted that the inclusion of the title "doctor" constituted an advertisement for a general practitioner. Moreover, no one would read through a telephone list of subscribers for the purpose of selecting a medical practitioner. In reply to this argument, it was shown that the fact of the inclusion of the words "opthalmic surgeon" in connexion with the names of certain practitioners had enabled some enterprising person, who had issued an unofficial list of subscribers, arranged according to occupations, to publish a special group of ophthalmic surgeons. This would have been impossible without the guidance found in the official book. Considerable importance was attached by some speakers to the inconvenience which would be caused to patients who sought the advice of an ophthalmic surgeon in the belief that he was practising in general medicine or gynæcology. It was pointed out by other speakers that the practitioner's name plate should serve as a sufficient guide to patients. In Sydney ophthalmic surgeons were in the habit of exhibiting the words "ophthalmic surgeon" on their name plates. Lastly, the ophthalmic surgeons contended that the practice had obtained many years, had not done any harm and was incapable of abuse.

Before the discussion closed the proposal was made that the ophthalmologists should be excluded from the rule, in view of the fact that they were in greater need of protection from competition by unqualified persons than any other group of practitioners. To this proposal the objection was raised that if an exception were made in favour of one class of practitioner, it would not be long before another group of specialists would claim the same privilege, and before long the general principle that a medical man should not

advertise in any way other than by the exhibition of a name plate, would be abandoned.

The President summed up the position impartially, and Dr. C. H. E. Lawes moved that the question be referred to the Federal Committee, in order that the general principle might be determined not only for New South Wales, but for the whole of Australia. Dr. Litchfield seconded this proposal. It was lost on the show of hands.

The original motion was then put to the meeting and was carried by a large majority.

At a meeting of the Victorian Branch, held on June 5, 1918, two members were expelled from the Branch, on the ground that their conduct was held to be detrimental to the honour and interests of the Association.

The following has been nominated for election as a member of the New South Wales Branch:—

Ormond Gillespie Tunks, M.B., Ch.M., 1917 (Univ. Sydney), Engineers' Depôt, Moore Park.

The Royal Commissioner, his Honour Judge Wasley, who has been investigating the matters in dispute between the friendly societies in Victoria and the medical profession, finished the first part of his labours on June 14, 1918. After the last witness had given his evidence, counsel appearing for both sides addressed his Honour, and certain suggestions were put forward. His Honour announced that he would submit his report at an early date.

Obituary.

DUNCAN TURNER.

Duncan Turner was born in Argyleshire in 1839. He studied medicine in Glasgow, Edinburgh and London, and in 1865 he obtained the Licentiate of the Royal College of Surgeons of Edinburgh. In the following year he took the Diploma of the Apothecaries' Society of London, and in 1869 he secured the Licentiate of the Royal College of Physicians of London. In 1889 he became a Member of the College of Physicians. During the first few years after qualifying he practised in North London. In 1877 he came to Victoria and engaged in a large general practice in Mooney Ponds, where he remained for 24 years. At the end of that time he removed to Collins Street, Melbourne. For many years he was physician to the sanatoria for consumptives at Echuca and at Macedon. It was by persistent advocacy of the open-air treatment of pulmonary tuberculosis that he built up his reputation as a physician for diseases of the chest. Patients came to him from every State in Australia. He was never convinced of the fundamental truth of the bacillary origin of tuberculosis, and would not listen to those who claimed success from the use of tuberculin in this disease. The passing of Duncan Turner closes the list of the old type of practitioner who studied in the days before the microbic theory of disease was established, and to whom the "pathology of the living" was unknown. These physicians, by clinical experience, much knowledge of pharmacy and skill in the management of the patient and his environment, built up large practices and held the affection, respect and confidence of their patients, which many present-day practitioners may envy. Despite chronic ill-health, Duncan Turner conducted a very large practice for many years. He leaves a widow, one daughter and two sons, with whom we sympathize in their loss.

Special Correspondence.

(By our Special Correspondent.)

CANADA LETTER.

Medical Congress in Hamilton.

This year a departure is to be made from the usual custom of holding annual meetings of each medical association, and a joint congress has been arranged to take place in Hamilton, Ontario, from May 27 to June 1, 1918. During this week, the Canadian Medical Association, the Ontario Medical Association, the Canadian Association for the Prevention of Tuberculosis, the Canadian Public Health Association, and the Ontario Health Officers' Association will meet. An interesting programme has been arranged avoiding, whenever possible, duplication of subjects, and reciprocity of membership has been established, so that members of any of these Associations will be able to attend any meeting they wish. A symposium on the Returned Soldier Problem will be held at a joint session of the Canadian Medical Association, the Ontario Medical Association, and the Canadian Public Health Association.

The Control of Venereal Disease.

Saskatchewan is the first of the provinces of Canada to take definite action to prevent the spread of venereal disease. An Act is now in force in that province which provides that all cases of syphilis, gonorrhœa, or chancroid shall be reported by the physician in attendance to the Commissioner of Health. The physician is required to furnish particulars as to the age of the patient, his occupation, marital relations, and probable source of infection. Such information, of course, will not be made accessible to the general public. The name of the patient will not be given unless he fails to return for treatment for 30 days, in which case his name and address must be reported to the Health Commissioner, who is authorized to take the necessary steps to ensure that such patient receives adequate treatment. Provision has been made for the treatment of patients suffering from these diseases, and for the carrying out of the Wassermann test at the new pathological laboratory at the Regina General Hospital, and at the chemical laboratory of the University of Saskatchewan, at Saskatoon. An educational campaign throughout the province has been begun, to awaken the public to the dangers from these diseases.

In Ontario, some months ago, facts and figures in regard to the prevalence of venereal disease, were submitted to the Conservation Commission, by members of the Faculty of the University of Toronto, and of the staff of the Toronto General Hospital. In November last, Mr. Justice Hodgins, who conducted the investigation into medical practice in that province, was commissioned to look into the prevalence of venereal disease and its relationship to feeble-mindedness, and also into the methods at present in vogue for dealing with the feeble-minded, the imbecile, and the mentally deficient in that province. A report on the enquiry into venereal disease was submitted to the Government, and a Bill was introduced into the Ontario Legislature on February 25, 1918, and received its second reading on March 5. This Bill was then placed in the hands of a Special Committee for consideration. Its provisions are based on the recommendations contained in Mr. Justice Hodgin's report, and include the following: The compulsory examination of persons suspected by local health authorities to be suffering from venereal disease; the compulsory examination and treatment of all persons under arrest who are found to be suffering from these diseases; the free examination and treatment, at hospitals receiving Government aid, of persons declared fit for hospital treatment; the elimination of quacks and their medicines; the free distribution, to hospitals, of remedies and equipment for the treatment of those venereally infected; and the classification as "contagious" of venereal diseases.

The Enquiry Into Medical Practice in Ontario.

On the occasion of the opening of the new General Hospital at Toronto, in 1913, public announcement was made by the late Sir James Whitney, of the Ontario Government's intention to investigate all matters in connexion with medicine, as practised in that province. Mr. Justice Hodgins was subsequently appointed Commissioner of the Enquiry, and has since conducted a most extensive and thorough investigation into all matters relating to the practice of medicine. A comprehensive report has been prepared, embodying the findings of this investigation, and was submitted to the provincial Legislature on February 6, 1918. It contains a number of recommendations, of which the following may be cited. The practice of medicine is to be properly defined. A Medical Director is to be appointed for the Province of Ontario. Osteopaths, chiropractors, and

other drugless healers, practising in Ontario up to June 30, 1913, are to be permitted to continue to practise for six months, from January 1, 1918, without being subject to any disability or prosecution. After July 1, 1918, however, no one is to be permitted to practise medicine, as defined in the province, without a license from the College of Physicians and Surgeons, excepting those practising osteopathy on June 30, 1913, and holding a certificate from one of the five colleges recognized by the American Osteopathic Association, and having had five years' practice in Osteopathy, have obtained a certificate from the Association that they are qualified to pass an examination for license in the State with the highest standard. Christian Scientists are to be permitted to practise the regious tenets of their church, providing that any person exercising such for gain shall be required to possess a permit from the provincial board of health, certifying that the person in question is qualified to recognize diseases that are contagious and reportable under the Public Health Act. An Institute of Physical Therapy is to be established immediately, on the premises of the Toronto General Hospital, the staff to be selected from those who have had special training, and particularly those trained in war work; and the necessary equipment for the proper instruction of students in physical therapy is to be installed in the department of physics, at the University of Toronto, and a compulsory course in that subject established, with a view to preparing qualified graduates. Optometry is to be taught, in courses to be arranged by the Faculty of Medicine of the University of Toronto, the Optometrical Association, and the Toronto Technical School. The provincial registration of nurses is to be established, and only graduates of schools conducted by public hospitals, or by the province, to be known as "graduate," "trained," or "certified" nurses. Home nursing associations are to be incorporated, and provision made for the training of nurses to serve under practising physicians or a graduate nurse. The establishment of further training centres for nurses is also to receive immediate attention. The Constitution of the College of Physicians and Surgeons to be amended.

Treatment of the Tuberculous Soldier.

The first Bulletin of the Association of Medical Officers Caring for Tuberculous Soldiers in Canada, was published by the Military Hospitals Commission in January. It contained a review of the work accomplished, during 1917, in the treatment of soldiers suffering from tuberculosis. By the end of 1917, 2,075 soldiers had been treated in the sanatoria under the direction of the Commission; of these 1,358 had been discharged, and 1,717 were still under treatment. A valuable report on the vocational training of the tuberculous soldier was also given, in which the beneficial effects of occupation in all cases of tuberculosis was pointed out. Even patients confined to bed could be given something to do, for instance, needlework, or some similar occupation, which would take the patient's mind away from his own troubles. The importance of providing recreation and amusement for the men was also shown.

A second bulletin was issued on February 28, 1918. It gives the number of patients in the various sanatoria at that time as 1,348, of whom 986 had been overseas. A report on the work done in the province of Saskatchewan is contributed by Captain L. G. Houle, who points out that until the Earl Grey Sanatorium was opened, in July, 1917, the province was without accommodation for cases of tuberculosis, beyond a few beds in the general hospitals. Since then, 146 patients have been admitted to this institution, of whom 87 have been discharged and five have died. Of those discharged, 27 were improved, 19 were quiescent, 10 apparently arrested, and 2 unimproved; 6 were doubtful, one non-tuberculous, and 22 were classed as "untreated." The provincial sanatorium at Qu'Appelle, which was commenced before the war, was discontinued after August, 1914; however, a part of the original plan has been completed recently, and accommodation is now provided for 75 patients. Arrangements have been made for the admission of soldiers to the number of 32, and 22 are already undergoing treatment there. Captain Houle states that the men are more content at Qu'Appelle than at the Earl Grey Sanatorium, in Regina, where the distraction of the town make it difficult to enforce discipline, as the men are continually trying to evade the rules. He also refers to the need for a system of following up cases of tuberculosis that have been discharged.

Captain Mills gives a report on the situation in Nova Scotia, where, in order to provide accommodation for military patients, two pavilions and an infirmary have been added to the provincial sanatorium at Kentville. A vocational training building was completed in October, 1917, but has since had to be enlarged. Last summer a colony of tents was laid out to provide additional accommodation, and these were later replaced by three temporary wooden buildings.

The bulletin also contains abstracts from a booklet written by Mr. Thomas Denham, clerk to the Brighton Insurance Committee, England, in which it is proposed that self-supporting villages or colonies should be established for the treatment and care of tuberculous soldiers, and that when they are no longer required for military patients, these facilities should be available for the whole population.

Correspondence.

THE ACTION OF THE BICEPS.

Sir,—I have read with pleasure Dr. Colin MacKenzie's article on "Applied Comparative Anatomy," and have noted the correspondence in recent issues of your journal upon his conception of the action of the *m. biceps brachii*. I would like to make some observations upon the criticisms of Drs. Pockley and Royle, as they deal with certain fundamental principles of muscular action.

Dr. Pockley says: "On the principle of the mechanics of levers it would be a physical impossibility for the biceps to shorten to any marked extent without causing flexion." Fortunately for us, our equilibrium is not dependent upon the mechanical movement of inert material, but upon movement of living tissues. The voluntary muscular system of the body is not comparable to, nor worked upon, the purely material principles of the mechanics of levers. I would inform Dr. Pockley that he can obtain a biceps contraction of at least 3 cm. without altering the angle of flexion between the components forming the elbow joint. Muscular equilibrium is concerned with variations in the positions and alterations in the angles of a joint, and is maintained owing to a basic principle in myology—the principle of reciprocal elongation of muscle. The flexion angle, which the components of the elbow articulation bear to one another, alters, not merely because the *m. brachialis* contracts, but because the *m. triceps* is in action also. Without physiological relaxation of the *m. biceps* and its subsequent elongation by the shortening *m. brachialis*, flexion of the elbow is impossible. The *m. triceps* is the reciprocal elongator of the *m. brachialis*, since both act upon the same centre of motion. This principle, it must be remembered, is inoperable in tests made upon articulated skeletons, dissecting-room subjects, and in electric stimulation of muscle. If one attach in an articulated upper limb skeleton, a strap to the radius in the position of the *m. biceps* and pull upon the strap, the elbow will flex, but not if a rigid piece of strap is applied behind the joint from humerus to ulna, for this is what triceps inhibition means. The radius can be regarded as a rotating cylinder, introduced for the purpose of pronation and supination, and on the side of this rotating cylinder the *m. biceps brachii* is attached.

According to Dr. Royle, "if we watch the triceps during forcible supination when the forearm is extended on the arm there is a simultaneous contraction of the triceps, and the physiological purpose of that contraction must be to counteract some force tending to flex the elbow, which is the movement antagonistic to that if the triceps. But only supination has been attempted. The most reasonable explanation is that the triceps opposes the flexing action of the biceps." This explanation is not correct. . . . It implies that two physiological opponents, according to Dr. Royle, are contracting at one and the same time. The degree of contraction of *m. triceps*, *i.e.*, of extension of forearm, is purely volitional. We can forcibly supinate in moderate or full (taut) extension. Why we tighten up our *m. triceps* during forcible supination, is with the object of

converting the limb into one piece so as to aid supination, by introducing lateral rotation of the shoulder. But forcible contraction of the *m. triceps* is only permitted by corresponding relaxation and elongation of the muscle acting on the same centre of motion, *i.e., m. brachialis*. Exactly the same thing can occur with forcible pronation. By tightening the *m. triceps* we increase the pronating power by allowing medial rotation at the shoulder to act on a stiffened limb. Forcible extension of the elbow is not a necessary accompaniment of either forcible pronation or supination. A somewhat analagous condition can occur in the lower limb. With the *m. quadriceps* contracted we can raise the foot from the ground by the action of the *m. psoas*. If a more effective elevation is required, as in kicking a football, we tighten the *m. quadriceps* more.

Again, Dr. Royle writes: "In the living subject, a movement of flexion, commenced with the hand supine and the elbow extended, is accompanied by a contraction of the biceps muscle, and this contraction represents force expended." This is the movement athletes perform when they endeavour to display the "flexing" action of the biceps. They are always careful never to flex the elbow with the forearm fully pronated. They recognize the supinating action of the *m. biceps*. During the movement the *m. biceps* is in action all the time, being watched by its physiological antagonists, *viz.*, pronators acting on the same centre of motion (radio-ulnar). Supination in the extended position, it is important to remember, is mainly caused by the *m. supinator*. The *m. biceps* is mainly the supinator of flexion. With bending of the elbow, not only is the work of the *m. biceps* as a supinator increasing, but it must accommodate itself to the altering angle of the elbow joint, which is rendered possible by the elasticity of its connective tissue elements. Its physiological contraction has nothing to do with effecting the bending of the elbow. By its contraction it has to maintain the supine position of the forearm, and by its elasticity to accommodate itself to the altering angle of flexion which is being produced by the *m. brachialis*. We can throw it into a physiological state of relaxation by fully pronating, and yet forcible flexion of the elbow can go on.

This movement brings in a second important principle in myology, *viz.*, muscles passing over more than one joint can accommodate themselves to alterations in the angles of the components forming these articulations. Whether the *m. biceps* is producing supination and is contracted, or whether it is reciprocally elongated and relaxed in pronation, it, like all the other muscles crossing the articulation, possesses the propertly of accommodation.

Dr. Royle further writes: "It may be asked why the biceps does not always supinate in preference to flexing, and the answer is that its supinating action is counteracted by the pronator muscles of the forearm when flexion is performed in the prone position and in association with contraction of of the flexors of the wrist and hand." Pronation is effected by the pronators which have contracted and shortened owing to their physiological opponents acting on the same centre of motion (radio-ulnar) having relaxed. In complete pronation the *m. biceps* is physiologically relaxed and elongated, yet, according to Dr. Royle, a muscle which is physiologically relaxed, and reciprocally elongated by muscles acting on its own centre of motion (radio-ulnar), is able to physiologically contract and call into physiological relaxation and reciprocal elongation another muscle (*m. triceps*) acting upon a separate centre of motion (humero-ulnar).

Flexion of the elbow with complete pronation is, it may be pointed out, independent of either flexion or extension of the wrist and hand. It can occur with either of these movements.

Thus can be mentioned a third principle in myology, *viz.*, muscles cannot be in a physiological state of relaxation and contraction at one and the same time. Relaxation (which permits of elongation) and contraction are opposite physiological states. A muscle cannot be at one and the same time an extender and a bender.

It is well to remember that in a dissection displaying fully the *m. brachialis* it will be seen that it is a "muscular" muscle having an attachment to the ventral, lateral, and medial surfaces of the shaft of the humerus sometimes extending over two-thirds of its length. Students frequently omit in their dissections to fully expose this muscle, and it may be that they fail to appreciate its true position and size.

The question of *m. biceps* action is of more than academic interest. It appears to me that not only has Dr. Mackenzie defined the true function of *m. biceps brachii*, but furthermore has shown us the position of physiological rest.

Yours, etc.,

ATHOL S. M. TYMMS.

88 Collins Street, Melbourne,
June 15th, 1918.

AVULSION OF THE SKIN OF SCROTUM AND PENIS.

Sir,—The following notes of a case of complete avulsion of the skin of scrotum and penis may be of interest, as supplementing the report of Dr. Aspinall's case reported in the issue of the *Journal* dated June 15, 1918. In my case the condition was as described by Dr. Aspinall in every detail. Tying the few bleeding points there were, one buried the testes in the flap of scrotum left and a little more space obtained by undermining outwards. The bared penis was then dealt with as follows. A transverse incision was made 2.5 cm. below the umbilicus. The skin was then undermined from this opening to the root of the penis with blunt pointed scissors. A pair of forceps was passed through from above and the penis grasped and pulled through, and the remaining tags of prepuce were stitched to the skin. The penis was now a subcutaneous organ, and the patient was left in this condition for three weeks, during which time he had no discomfort, and urine was passed through the opening below the umbilicus. When healing was complete two lateral incisions freed the buried organ, with skin soundly healed to its ventral surface and a liberal flap on each side. The flaps were wrapped round the penis and sutured along the dorsum, and the bare area on the abdomen was easily covered. The result is excellent.

Yours, etc.,

K. ST. VINCENT WELCH.

Narandera,
June 15, 1918.

Births, Marriages and Deaths.

The charge for inserting announcements of Births, Marriages and Deaths is 5s., which sum should be forwarded in money orders or stamps, with the notice, to arrive not later than Tuesday morning in order to ensure insertion in the current issue.

MARRIAGE.

KENT HUGHES—LELEAN.—On June 12, at St. Peters,' Melbourne, William Kent Hughes, son of Ellen and the late Charles William Hughes, to Constance Lelean, daughter of Isabella and the late Reverend Arthur Lelean.

Proceedings of the Australian Medical Boards.

NEW SOUTH WALES.

The following have been registered, under the provisions of the *Medical Act, 1912 and 1915*, as duly qualified medical practitioners:—

Grant, Mavis Victoria, M.B., Mast. Surg., 1918, Univ. Sydney.

Kenny, Hilary James, M.B., Mast. Surg., 1918, Univ. Sydney.

Additional Registration.

Saxby, George Jacob Maxwell, Mast. Surg., 1918, Univ. Sydney.

Books Received.

MEDICAL CONTRIBUTIONS TO THE STUDY OF EVOLUTION, by J. C. Adami, M.D., F.R.S., F.R.C.P.; 1918. London: Duckworth & Co. Demy 8vo., pp. 372, illustrated. Price, 18s. net.

DISEASES OF THE DIGESTIVE ORGANS, WITH SPECIAL REFERENCE TO THEIR DIAGNOSIS AND TREATMENT, by Charles D. Aaron, Sc. D., M.D., second edition, thoroughly revised; 1918. Philadelphia: Lea & Febiger. Royal 8vo., pp. 818, illustrated with 156 engravings, 48 roentgenograms and 9 coloured plates. Price, $7.

MODERN UROLOGY IN ORIGINAL CONTRIBUTIONS BY AMERICAN AUTHORS, edited by Hugh Cabot, M.D., F.A.C.S., in two volumes; 1918. Philadelphia: Lea & Febiger. Royal 8vo., pp. 744 and 708, illustrated with 632 engravings and 17 plates in all. Price, $7 each.

THE COMPLETE MEDICAL POCKET-FORMULARY AND PHYSICIAN'S VADE-MECUM, collated for the use of practitioners, by J. C. Wilson, A.M., M.D., sixth edition, thoroughly revised by Creighton H. Turner, M.D.; 1917. Philadelphia: J. B. Lippincott Company. Sydney: Angus & Robertson, Ltd. Pocket Size, pp. 278. Price, 12s. 6d. net.

Medical Appointments.

Dr. W. H. Orchard (B.M.A.) has been appointed Acting Officer of Health to Williamstown, Victoria, during the absence of Dr. H. R. Maclean (B.M.A.) on active service.

The appointment of Dr. C. A. Courtney (B.M.A.) as Officer of Health to the North and South Ridings of the Shire of Eltham and of Dr. W. A. Bradford as Officer of Health to the Shire of Ferntree Gully, is announced in the Victoria Gazette of June 12.

The appointment of Dr. E. W. J. Ireland as House-Surgeon at the Launceston General Hospital is to take effect from June 5, 1918.

Dr. E. L. Morgan has been appointed Junior Assistant Microbiologist, on probation, to the Department of Public Health, New South Wales.

The appointment of Dr. R. Graham Brown as Honorary Surgeon to the Ear, Nose and Throat Department of the Hospital for Sick Children, Brisbane, is announced.

A Correction.

In *The Medical Journal of Australia* of June 8, 1918, page 486, the announcement of the appointments of Drs. R. W. Hornabrook and Frank Andrew was incorrectly given. Dr. R. W. Hornabrook was appointed Honorary Anæsthetist to the Melbourne Hospital and Dr. Frank Andrew Honorary Surgeon for the Ear and Throat at the Melbourne Hospital.

Medical Appointments Vacant, etc.

Rendwick Hospital for Infants, Sydney, Senior Resident Medical Officer and Junior Resident Medical Officer.

Hospital for Sick Children, Two Resident Medical Officers.

Medical Appointments.

IMPORTANT NOTICE.

Medical practitioners are requested not to apply for any appointment referred to in the following table, without having first communicated with the Honorary Secretary of the Branch named in the first column, or with the Medical Secretary of the British Medical Association, 429 Strand, London, W.C.

Branch.	APPOINTMENTS.
VICTORIA. (Hon. Sec., Medical Society Hall, East Melbourne.)	All Friendly Society Lodges, Institutes, Medical Dispensaries and other contract practice. Australian Prudential Association Proprietary, Limited. National Provident Association. Life Insurance Company of Australia, Limited. Mutual National Provident Club.
QUEENSLAND. (Hon. Sec., B.M.A. Building, Adelaide Street, Brisbane.)	Brisbane United Friendly Society Institute. Townsville Friendly Societies' Medical Union. Cloncurry Hospital.
SOUTH AUSTRALIA. (Hon. Sec., 8 North Terrace, Adelaide.)	The F.S. Medical Assoc., Incorp., Adelaide. Contract Practice, Appointments at Renmark.
WESTERN AUSTRALIA. (Hon. Sec., Health Department, Perth.)	All Contract Practice Appointments in Western Australia.
NEW SOUTH WALES. (Hon. Sec., 30-34 Elizabeth Street, Sydney.)	Australian Natives' Association. Balmain United F.S. Dispensary. Canterbury United F.S. Dispensary. Leichhardt and Petersham Dispensary. M.U. Oddfellows' Med. Inst., Elizabeth Street, Sydney. Marrickville United F.S. Dispensary. N.S.W. Ambulance and Transport Brigade. North Sydney United F.S. People's Prudential Benefit Society. Phœnix Mutual Provident Society. F.S. Lodges at Casino. F.S. Lodges at Lithgow. F.S. Lodges at Parramatta, Auburn and Lidcombe. Newcastle Collieries — Killingworth, Seaham Nos. 1 and 2, West Wallsend.
TASMANIA. (Hon. Sec., Macquarie Street, Hobart.)	Medical Officers in all State-aided Hospitals in Tasmania.
NEW ZEALAND: WELLINGTON DIVISION. (Hon. Sec., Wellington.)	Friendly Society Lodges, Wellington, N.Z.

Diary for the Month.

June 25.—N.S.W. Branch, B.M.A., Medical Politics Committee; Organization and Science Committee.
June 26.—Vic. Branch, B.M.A., Council.
June 28.—N.S.W. Branch, B.M.A.
July 2.—N.S.W. Branch, B.M.A., Council (Quarterly).
July 3.—Vic. Branch, B.M.A.
July 5.—Q. Branch, B.M.A.
July 9.—Tas. Branch, B.M.A., Council and Branch.
July 9.—N.S.W. Branch, B.M.A., Ethics Committee.
July 12.—S. Aust. Branch, B.M.A., Council.
July 12.—N.S.W. Branch, B.M., Clinical.
July 16.—N.S.W. Branch, B.M.A., Executive and Finance Committee.
July 17.—W. Aust. Branch, B.M.A.
July 18.—Vic. Branch, B.M.A., Council.
July 19.—Q. Branch, B.M.A., Council.
July 19.—Eastern Suburbs Med. Assoc. (N.S.W.).
July 20.—Northern Suburbs Med. Assoc. (N.S.W.).

EDITORIAL NOTICES.

Manuscripts forwarded to the office of this Journal cannot under any circumstances be returned.

Original articles forwarded for publication are understood to be offered to *The Medical Journal of Australia* alone, unless the contrary be stated.

All communications should be addressed to "The Editor," *The Medical Journal of Australia*, B.M.A. Building, 30-34 Elizabeth Street, Sydney, New South Wales.

The Honorary Librarian of the New South Wales Branch of the British Medical Association is anxious to complete the series of the *Lancet* at present in the library of the Branch, Volume I., January to June, 1898, Volumes I. and II., January to December, 1908, and Volume I., January to June, 1909, are needed for this purpose. The Librarian will be grateful if any member who is able to present to the library one or more of these missing volumes, either unbound or bound, will communicate with the Honorary Secretary of the Branch, Dr. R. H. Todd, B.M.A. Building, 30-34 Elizabeth Street, Sydney.